

THE DISTRESSED CONSUMER: ESSAYS ON THE EFFECT OF NEGATIVE  
EMOTIONS ON CONSUMER DECISION-MAKING

A Dissertation

by

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## **ABSTRACT**

Consumers experience negative emotions, such as anger and anxiety, for a variety of reasons. Research has shown that emotions such as these often spillover and effect downstream decisions that are unrelated to the source of the emotion. This research examines the effect of anger and anxiety on such incidental decisions. First, I look at how anxiety from falling behind on goals effects financial decision making. I show that anxiety activates the desire to catch up with the goal, which in turn activates the desire to be more efficient with resources, such as time and money. This desire not only causes anxious consumers' to seek efficiency with their resources while pursuing the goal, but also causes them to seek efficiency while making unrelated decisions, such as while shopping, or while choosing between different discretionary activities. Consequently, because discounted goods and activities (i.e., activities that can be done faster than usual) take fewer resources than usual, I find that anxiety increases proneness for discounts. Second, I examine the effect of anger and anxiety on self-control behaviors. I find that anger and anxiety, unlike neutral emotion, activate specific needs. Anxiety activates the need for security, while anger activates the need for dominance. As a consequence anxiety enhances self-control when self-control provides security benefits rather than inconsistent benefits, such as dominance. On the other hand, anger enhances self-control when self-control provides dominance benefits rather than inconsistent benefits, such as security. Since many self-control behaviors provide both benefits - such as savings providing both wealth related status, and greater financial security -

motivating self-control through its association with the consistent benefit can increase it among anxious and angry individuals.

## **DEDICATION**

Dedicated to my husband Himanshu, and my parents.

The coolest muggles I know.

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## **CHAPTER 1**

### **INTRODUCTION**

In this research, I look at the effect of specific negative emotions on consumption behaviors. In the first essay, I examine how anxiety effects financial decisions. To examine anxiety's effect on financial decisions, I break down anxiety into two distinct types, depending on whether anxiety is induced during a goal, or by events that individuals cannot control. When individuals experience anxiety while working on personal goals, such as a challenging work assignment, or a project that has a tight deadline, they experience what we call active anxiety. On the other hand, when individuals experience anxiety due to threats that cannot be acted upon, such as an economic recession, a terrorist attack, or an outbreak of a viral disease, they experience what we call passive anxiety.

Active anxiety, unlike passive anxiety induces the desire to catch up with the goal (Carver and White 1994; Hobfoll 1989; Inzlicht and Legault 2014). Because active anxiety motivates consumers to catch up with their goals, it activates the desire to be more efficient or productive with resources, such as time or money. For instance, a student who feels anxious while studying infers that she needs to study more chapters every hour than she had earlier planned to study. Similarly, a wage earner who feels anxious while managing his monthly expenses infers that he needs to cover a greater share of his monthly expenses with every dollar than he had earlier planned. Consequently, I predict and show that active anxiety also causes consumers to seek

efficiency in contexts unrelated to the source of anxiety, such as while shopping or while choosing between activities. Specifically, I find that active anxiety increases discount proneness, and overconsumption after paying a fixed cost for unlimited consumption, such as at an all-you-can-eat buffet.

However, it's important to note that efficiency seeking does not always result in good or rational behavior. For instance, discount proneness, and overconsuming after paying a fixed cost, such as at a buffet, can often hurt consumers' long term goals, such as that of saving money (Lichtenstein, Netemeyer, and Burton 1990; Thaler 1985), or of healthy eating. Therefore, even though efficiency according to lay wisdom usually refers to good, and optimal choices, efficiency seeking as prior literature and I conceptualize it, can potentially lead to irrational choices. In defense of this, Fernbach, Kan and Lynch (2016) suggest that this efficiency mindset is in fact a desire to maximize local efficiency, which is characterized by a local vision to get more benefit for every unit resource, without considering what this extra benefit means in the larger context (i.e., is it essential or necessary?).

In the second essay, I examine how seemingly poor behaviors caused by negative emotions, such as overspending, or allocating time to less necessary activities, can be mitigated. Prior literature has sufficiently shown that negative emotions impair self-control (Tice, Bratslavsky, and Baumeister 2001). For instance negative emotion cause consumers to overeat (Andrade 2005; Fedorikhin and Patrick 2010; Garg, Wansink, and Inman 2007), and to overspend money (Cryder et al. 2008). In this essay I provide for a way through which self-control impairments, such as these, can be minimized among

consumers feeling angry or anxious. I find that anger and anxiety, unlike neutral emotion, activate specific needs. Anxiety activates the need for security, while anger activates the need for dominance. As a consequence anxiety enhances self-control when self-control provides security benefits rather than inconsistent benefits, such as dominance. On the other hand, anger enhances self-control when self-control provides dominance benefits rather than inconsistent benefits, such as security.

Since many self-control behaviors provide both benefits - such as savings providing both wealth related status, and greater financial security - motivating self-control through its association with the consistent benefit can increase it among anxious and angry individuals. For instance, angry consumers are more likely to save money when it helps gain wealth and power, than when it helps save for a rainy day. On the other hand, anxious consumers are more likely to save when it helps them save for a rainy day than for wealth and power.

Across the two essays I show that negative emotions impact a wide range of behaviors that are unrelated to the source of the emotions. Through my research I hope to help consumers understand how experiencing negative emotions can affect their consumption patterns. For instance, by being aware that anxiety enhances their deal proneness, consumers may be able to cut down on overspending on deals while feeling actively anxious. I also want to inform strategy aimed at marketing to consumers experiencing negative emotions. For instance marketing products to angry consumers will be vastly different from marketing products to anxious consumers or consumers

feeling neutral. Understanding the motivations of emotional consumers can greatly improve how firms interact with these consumers.

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## **CHAPTER 2**

### **HOW ANXIETY EFFECTS RESOURCE ALLOCATION: AN EFFICIENCY**

#### **SEEKING ACCOUNT**

##### **Introduction**

Consumers feel pressure to attain a wide range of goals. They want to succeed at work, lose weight, make friends, raise better children – even to take more steps (both literally and figuratively; Kasser 2002). Social media and mobile applications like GoalsOnTrack, LifeTick, and MyFitnessPal, have amplified this pressure by making it easier than ever to share goals with others, gather information about others’ goal pursuit, and receive feedback about one’s own progress, or the lack thereof. An increased focus on pursuing goals and monitoring progress has many advantages (Carver 1979; Gollwitzer 1999), but it also makes goal discrepancies, or the lack of goal progress, more salient. As a consequence, individuals regularly experience anxiety about not making as much goal progress as they had planned (Carver and White 1994; Hobfoll 1989; Inzlicht and Legault 2014).

How does feeling anxious influence the manner in which consumers allocate resources, including time and money, while making decisions? We argue that the answer depends on the source of anxiety. People can be anxious about not making sufficient goal progress. But they can also be anxious about epidemics, terrorist attacks, climate change, and other general threats that are completely outside of their control. Anxiety

induced by slow goal progress (hereafter, *active anxiety*) is associated with a sense of agency and motivates consumers to increase their rate of goal progress. On the other hand, anxiety induced by uncontrollable threats (hereafter, *passive anxiety*) is associated with a lack of agency. Consequently, active anxiety, but not passive anxiety, makes consumers want to use their resources, including time and money, more efficiently in order to make up lost ground in goal pursuit.

A desire to use resources efficiently (hereafter, *efficiency seeking*) in turn motivates consumers to try to accomplish more activities in less time and to acquire more products and services for less money. Therefore, a consumer who is anxious about a work deadline or an approaching exam will be more likely to (a) try to complete multiple activities at the same time (i.e., multitask), (b) consume more when they have paid an all-inclusive fixed cost compared to when they need to pay for each item (e.g. an all-you-can-eat buffet vs. an a la carte menu), (c) select activities that can be completed in less time than normal when planning their schedule, (d) select products that cost less than normal (e.g., discounted products) when choosing between an assortment of items, and (e) select options that avoid additional charges and fees (e.g., shipping expenses). Conversely, because passive anxiety results from uncontrollable threats, it neither signals insufficient goal progress nor activates a desire for efficiency. Consequently, passively anxious consumers are no more motivated to accomplish more in less time or buy more for less money than consumers who are not anxious. For instance, consumers who are anxious about a terrorist attack or an approaching storm will not be more likely

to multitask or to overconsume after paying for unlimited consumption than consumers in a neutral emotional state.

Our research contributes to the literature in four ways. One, we distinguish between two qualitatively distinct types of anxiety that have different sources and different consequences on consumer behavior. Two, we demonstrate that anxiety that stems from slow goal progress influences a wide range of decisions by changing how consumers allocate their time and money. We thereby demonstrate that being anxious about a work deadline or upcoming exam influences apparently unrelated decisions, such as how consumers schedule their leisure activities and which items they purchase on a shopping trip. Three, we identify why and when anxiety causes consumers to engage in counter-productive activities and make unnecessary purchases. Increased efficiency seeking helps explain why anxiety can lead to a series of maladaptive decisions that often make it more difficult for consumers to complete their focal goals. Four, although past research has examined how perceptions of goal progress influence subsequent decisions related to that goal (Huang and Zhang 2011; Khan and Dhar 2006; Zhang, Fishbach, and Dhar 2007), there is little work on how perceptions of goal progress (or lack thereof) influence unrelated decisions. By studying the effects of anxiety experienced during goal pursuit, we demonstrate how perceptions of goal progress influence a wider range of decisions.

## **Anxiety and Efficiency Seeking**

Consumers pursue a wide variety of goals in their day-to-day lives. Achieving these goals, however, is difficult. Unplanned obstacles and distracting opportunities regularly impede consumers' goal progress. For example, having a flu or deciding to go to a party instead of studying could slow a student's progress towards earning their degree. As goal progress slows, consumers perceive a discrepancy between where they planned to be and where they actually are with respect to their goal (Carver 1979; Carver and Scheier 1990; Carver and White 1994). For instance, a student who has not studied for an approaching exam might perceive a discrepancy between how much she thinks she should have studied and how much she has actually studied.

Noticing a discrepancy in goal progress signals that progress is going badly, which activates negative emotions, such as disappointment, frustration, or anxiety (Carver and Scheier 1990; Carver and White 1994; Hsee and Abelson 1991; Hsee, Abelson, and Salovey 1991; Inzlicht, Bartholow, and Hirsh 2015; Inzlicht and Legault 2014). Negative emotions signal that consumers need to adjust their behavior. Different negative emotions, however, signal different impediments to goal progress and motivate different responses (Carver and Scheier 1990; Ford and Tamir 2012; Millgram et al. 2015; Tamir 2016; Tooby and Cosmides 1990). Disappointment signals that a goal is no longer attainable and motivates consumers to release the goal and try something else (Salerno, Laran, and Janiszewski 2014). Frustration, on the other hand, signals that some external factor is obstructing the consumer's path to the goal, but that it hasn't lowered

the probability of attaining the goal (Carver and Harmon-Jones 2009). Consequently, it motivates consumers to remove the obstruction in order to get back on track. Anxiety, the focus of our research, indicates that the discrepancy may have lowered the probability of the goal attainment (Carver and Scheier 1990; Carver and White 1994; Inzlicht and Legault 2014). For instance, encountering traffic while driving to the airport can cause frustration if the driver is confident they will still be able to catch their flight, anxiety if the driver perceives a risk of missing the flight, or disappointment, if the driver is certain they will miss the flight. Therefore, anxiety is experienced when the discrepancy in the rate of goal progress threatens but does not eliminate the possibility of goal attainment. This anxiety signals to consumers that they are lagging behind on their goals, but that they can potentially make up for it by speeding up their rate of progress.

Anxiety, however is not only experienced when individuals make insufficient goal progress. In general, anxiety is experienced when individuals perceive a threat (Raghunathan and Pham 1999; Smith and Ellsworth 1985). Sometimes this threat is the result of a consumer not making sufficient goal progress (Carver and Scheier 1990; Inzlicht and Legault 2014), but other times the threat is the result of an environmental factor outside of the consumer's control (Durante and Laran 2016). In former case, which we call active anxiety, consumers retain agency in that they have the ability to potentially remove or overcome the anxiety inducing threat. In the latter case, which we call passive anxiety, consumers do not retain agency in that they do not have the ability to resolve or remove the anxiety inducing threat. An individual struggling to lose weight, a student facing a difficult exam, and a consumer researcher approaching a conference

deadline would all be feeling active anxiety because the outcome of the situations will depend largely on their behavior. Passive anxiety, on the other hand, occurs when individuals are worried about a threat that is caused by circumstances outside of their control, such as the spread of a virus, global warming, a terrorist attack, or waiting for the grade after taking an exam. Because passive anxiety results from the threat of events beyond one's control, it does not signal the need to make faster goal progress. We therefore predict that active anxiety, but not passive anxiety, will motivate consumers to make faster goal progress.

How can consumers who are feeling actively anxious improve their rate of goal progress? One way is by using their resources more efficiently. That is, they can try to get more value for every unit of resource they spend. For example, a student who is anxious about not having studied enough can try to make up for lost time by speed-reading text book chapters. Similarly, a consumer who is anxious about exceeding his monthly budget might be more likely to clip coupons or purchase items on sale in attempt to spend his money more efficiently. In sum, we hypothesize that experiencing active anxiety (i.e., anxiety resulting from a negative discrepancy in perceived goal progress) makes consumers try to use their resources more efficiently compared to experiencing either passive anxiety or no anxiety.

## **Active Anxiety and Resource Allocation**

Resources refer to tangible and intangible assets that individuals and institutions can exchange in order to reach their goals (Dorsch, Törnblom, and Kazemi 2016; Hobfoll 1989). We focus on two resources that consumers are especially likely to utilize during goal pursuit: time and money (Gino and Mogilner 2014; Okada and Hoch 2004; Zauberman and Lynch 2005). With the possible exception of the extraordinarily wealthy, consumers have only a limited supply of these two resources (Fernbach, Kan, and Lynch 2015; Zauberman and Lynch 2005). The more time or money that a consumer spends on one goal, the less she will have available for others. Spending the night studying prevents a student from attending a party, just as spending \$100 on a fancy dinner leaves a consumer less money to pay the rent.

What happens when consumers perceive that their store of resources is shrinking? Fernbach and colleagues (2015) suggest that consumers use two different strategies in this situation. One is to try to be more efficient by squeezing more value out of every resource they use. For example, a shopper who is worried about running out of money may try to buy less expensive versions of all the items on his grocery list. The other strategy is to prioritize, which involves allocating resources to only the most important goals while either abandoning or neglecting less important goals. For example, a financially constrained shopper may instead decide to remove less important, or discretionary items from his grocery list. Consumers initially attempt to overcome a perceived resource constraint by using their resources more efficiently. Only when



resources become increasingly scarce do consumers switch from trying to be more efficient to prioritizing their pursuits (Carver and Scheier 1990; Carver and White 1994; Fernbach et al. 2015). For example, a shopper feeling slightly poor would try to find better deals so he could buy everything he wanted, whereas a shopper feeling really poor would forego the less important purchases and only buy the more important necessities.

Feeling anxious about insufficient goal progress signals that the consumer is in jeopardy of not reaching her goal. Will this prompt consumers to be more efficient or to prioritize? There are two reasons to predict that feeling anxious about goal pursuit will be more likely to increase efficiency seeking than prioritization. One, anxiety signals that the consumer is not making sufficient progress, but that the goal is still attainable. In other words, anxiety indicates that resources are constrained, but not severely so, and milder resource constraints tend to increase efficiency seeking rather than prioritization. Two, when both strategies are feasible, anxious consumers should prefer seeking efficiency to prioritizing because prioritization is more cognitively effortful than efficiency seeking (Fernbach et al. 2015) and anxious consumers typically prefer less effortful decisions (Darke 1988; Eysenck et al. 2007; MacLeod and Donnellan 1993; Shackman et al. 2006; Sorg and Whitney 1992). Only when the risk of failing on the goal becomes high due to dire scarcity in resources, will anxious consumers be likely to prioritize.

## **Efficiency Seeking and Choice**

Volumes of studies demonstrate that emotions influence judgments and decisions unrelated to the source of the emotion (Avnet, Pham, and Stephen 2012; Strack 1992; Han, Lerner, and Keltner 2007; Lerner and Keltner 2000; Raghunathan and Pham 1999). Feeling sad about the weather can cause people to report lower life satisfaction (Schwarz and Clore 1983), just as fear caused by a terrorist attack can make people more afraid of getting the flu (Lerner et al. 2003). We similarly expect that being anxious about a personal goal should increase efficiency seeking, regardless of whether or not the decision is related to the source of anxiety, across different types of resources (i.e., time and money). For example, if a student is anxious about not having enough time to study for an exam, we predict that she will not only try to use time more efficiently while studying, but that she will also try to use time more efficiently while performing chores or leisure activities, and use money more efficiently while shopping.

Consumers perceive that they are using their resources efficiently when the reference cost of the benefits they expect to receive in exchange for time or money exceed the price they paid (Kahneman and Tversky 1979; Thaler 1985). For instance, if a consumer acquires a product that has a reference cost of \$10 for \$8, he would feel that he spent his money efficiently. Reference costs are determined by several factors, including the cost of similar products, services and activities in prior consumption instances (Helson and Harry 1964; Niedrich, Sharma, and Wedell 2001; Parducci 1965), the amount of resources that others have spent on similar products, services, or activities

(Mezias, Chen, and Murphy 2002), and the cost suggested by a retailer or other third party (Grewal, Monroe, and Krishnan 1998; Hardie, Johnson, and Fader 1993; Kan et al. 2014; Mayhew and Winer 1992). Consumers seeking efficiency should thus be especially attracted to opportunities that cost less time (e.g., a restaurant with a shorter than normal wait time) and less money (e.g., a pair of shoes on sale) relative to their reference costs. Because products available at a discount can be acquired for less than the reference cost, individuals seeking efficiency should be particularly attracted to discounts, as highlighted in the example cited earlier. Similarly, an activity that typically takes an hour (e.g., reading a book chapter) should seem efficient if it can be completed in 40 minutes (e.g., by speed-reading).

Furthermore, efficiency seeking should not only encourage consumers to select products and activities on discount, but also motivate them to avoid additional fees and surcharges (e.g., shipping and handling), at least when the additional fees can be avoided. For example, suppose that shipping charges for a \$25 shirt are normally \$10, but the shipping fee is waived if the consumer spends \$50 or more. In this situation, a consumer seeking efficiency should be more likely to make an unplanned purchase of another \$25 shirt in order to avoid the shipping fee. In this situation, making the unplanned purchase would increase the consumers' perceived efficiency by giving them \$60 worth of purchases (i.e., reference cost for the shirts of \$50 plus \$10 shipping) for only \$50, rather than giving them \$35 worth of purchases (i.e., reference cost for one shirt plus shipping) for \$35.

Finally, efficiency seeking should also motivate consumers to complete more activities in a set amount of time and consume more of a product or service for a set amount of money. For instance, efficiency seeking consumers should be more likely to attempt to complete multiple activities at the same time, as this allows them to use a single period of time for two activities rather than one. Similarly, efficiency seekers should eat more at an all-you-can eat buffet than when they have to pay to consume on an *a la carte* basis. When consumers pay a fixed cost for unlimited use (e.g. an all-you-can eat buffet or an unlimited drink package), then each additional item that they consume reduces the perceived cost per item. For instance, a consumer who eats four slices of pizza at a \$10 all-you-can eat pizza buffet ends up paying less per slice (i.e.,  $\$10/4 = \$2.5$ ) than a consumer who eats only two slices ( $\$10/2 = \$5$ ). As a result, efficiency seeking should increase the number of items consumed when the consumer has paid a fixed price for unlimited consumption relative to when the consumer has to pay a variable price for each item.

In sum, we predict that relative to experiencing passive anxiety and a neutral emotional state, experiencing active anxiety increases efficiency seeking. Additionally, we predict that this pursuit of efficiency should occur regardless of whether a decision helps consumers reach important goals. Unlike consumers who respond to a resource constraint by prioritizing their pursuits, consumers seeking efficiency are trying to reach all of their goals without adjusting or dropping any (Fernbach et al. 2015). Consequently, consumers anxious about a personal goal may ironically spend resources on other less important goals, rather than the more important ones, if the less important

goal can be accomplished with fewer resources than its reference cost. For instance, a student anxious about her exam may choose to do chores or catch up with friends over coffee if these activities can be completed in less time than usual, even though studying without interruption would probably be more beneficial. Similarly, a consumer anxious about a work deadline may buy products that are available at a price discount rather than products that satisfy active needs or goals. Thus, we predict that efficiency seeking can cause consumers to spend resources on efficient options that may not be important or relevant to their focal goals.

In summary, we predict that active anxiety, but not passive anxiety, increases efficiency seeking relative to a neutral emotional state. Consequently, actively anxious consumers should be more likely to a) multitask, b) consume more items when they are billed at a fixed cost (i.e., cost independent of the number of units consumed) rather than a variable cost (i.e., cost dependent on the number of units consumed), c) prefer activities that take less time than normal (i.e., discounted activities), d) prefer price discounts, and e) desire to qualify for exemption from add-on costs (e.g., shipping). We test these predictions in five experiments in which we vary whether or not participants experience anxiety as well as the source of their anxiety before asking them to make one or more ostensibly unrelated decisions.

## Emotion Manipulation

In studies 1 through 4 we manipulated emotions using an emotion induction adapted from the literature (Lerner and Keltner 2001; Winterich and Haws 2011). The emotion induction was described as investigating common life experiences of participants. Specifically, we asked participants to write essays about events that make them feel (a) actively anxious, (b) passively anxious, or (c) neutral. In the active anxiety condition, we asked participants to write about the goals that are currently making them anxious: *Most people have a lot to be anxious about—exams, jobs, maintaining healthy weight, getting enough sleep, and other life goals which they have trouble attaining. Think of a couple of such goals that you're anxious about not attaining.* In the passive anxiety condition, we asked them to write about global threats that are currently making them anxious: *There is a lot to be anxious about in the world today – climate change, the uncontrollable spread of viruses like Zika and Ebola, the rising cancer rates, the increase in the number of plane crashes due to bad weather, the ever-present threat of terrorist attacks. Think of a couple of such threats that make you feel anxious. Please write two-three sentences about each of these threats.* In the neutral emotion condition, we asked participants to describe where they are currently accessing information: *There are a lot of sources of information nowadays– internet articles, informative YouTube videos, resources provided by the college library, etc. Think of a couple of sources that you use to access information.* Participants in the active and passive anxiety conditions next wrote about the one goal (active anxiety condition) or the one threat (passive

anxiety condition) that makes them the most anxious. In the neutral emotion condition, participants wrote about the information source that they most frequently use.

We tested the effectiveness of the emotion manipulation by asking a sample of participants at a Southwestern university in the United States ( $N = 183$ ) to indicate how anxious, worried, nervous, angry, frustrated, sad and negative they felt after completing the emotion manipulation on a 9-point scales (1 = not at all, 9 = very much). We averaged the ratings for “anxious”, “worried”, and “nervous” to form a composite score for anxiety ( $\alpha = .869$ ).

To examine the effects of emotions on the measure of anxiety, we conducted a 3 (emotion: active anxiety, passive anxiety, neutral) between-subjects ANOVA. The results revealed the predicted main effect of emotion ( $F(2, 180) = 3.24, p = .041$ ). Specifically, neutral participants ( $M = 2.50$ ) were less anxious than participants in the active anxiety condition ( $M = 3.05; F(1, 180) = 5.35, p = .022$ ) and participants in the passive anxiety condition ( $M = 3.00; F(1, 180) = 4.28, p = .040$ ). On the other hand, actively anxious participants were just as anxious as the passively anxious participants ( $F(1, 180) = .04, NS$ ).

There was no effect of the emotion manipulation on frustration ( $F(2, 180) = .06, NS$ ) nor anger ( $F(2, 180) = 1.15, NS$ ). However, the emotion manipulation did influence sadness ( $F(2, 179) = 4.82, p = .01$ ), such that passively anxious participants ( $M = 2.42$ ) were significantly more sad than actively anxious participants ( $M = 1.76; F(1, 179) = 8.95, p = .003$ ) and neutral participants ( $M = 1.92; F(1, 179) = 5.15, p = .025$ ). Participants in the neutral and active anxiety condition did not differ in sadness ( $F(1,$

179) = .53, *NS*). This is not completely unexpected, since the themes that evoke passive anxiety, such as diseases, climate change, terrorist attacks, can also simultaneously remind individuals about events in the past (e.g., death of a loved one, the Japanese Tsunami, 9/11, or the crash of the Malaysian Airlines flight) that evoke sadness. However, the increase in sadness in the passive anxiety condition cannot possibly explain our predicted results because, as earlier described, sadness should not affect efficiency seeking. Furthermore, sadness can't explain the difference between neutral and active anxiety conditions.

## **Study 1**

Our first study examined the effect of the different kinds of anxiety on efficiency seeking by examining whether and when anxiety makes online workers more likely to multitask. To do so, we tested whether participants chose to complete a series of tasks in an online study simultaneously rather than sequentially. By choosing to multitask, participants can use their time in a seemingly more efficient manner, making progress on both the activities at once. However, although multitasking allows participants to complete more tasks per every unit of time, the efficiency comes at a cost: reduced attention towards the tasks, which usually leads to worse performance (Han and Broniarczyk 2016). We thus predicted that actively anxious participants would be more likely to work on two activities simultaneously (rather than sequentially) compared to participants who are passively anxious and participants who are not anxious. We also



predicted that participants who chose to multi-task would perform worse on the activities.

## **Method**

Two hundred and seventy-five participants (126 males) recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. The experiment had a three condition (active anxiety, passive anxiety, neutral emotion) between-subject design. The study contained two parts disguised as unrelated studies. In the first part, participants were randomly assigned to an emotion condition using the aforementioned essay writing task. After the writing task, participants were asked to take two additional studies. The first study required them to memorize a list of German vocabulary words; the second study required them to watch and evaluate a video about twins (see Appendix B). They were then given the option to either complete the studies simultaneously (i.e., multitask) or sequentially (adapted from Han and Broniarczyk 2016). When participants chose to multitask, they were shown the list of German words and the video on the same screen. When they chose to perform the tasks sequentially, they were shown the list of German words and the video on different screens, one after the other. Choice of task (simultaneous = 1, sequential = 0) served as our key dependent variable. After memorizing the words and watching the video, memory for the tasks was measured using five questions (see Appendix B). The score on the memory-recall quiz served as a measure of task performance.

For all of the studies including this one, we made an a priori decision to filter out respondents who had previously completed either an older version of the study, or the essay manipulation (see appendix A for detailed filtering criteria). The sample sizes reported in each of the studies are the final counts after removing participants who did not qualify.

## **Results and Discussion**

In line with our predictions, the emotion manipulation significantly affected the likelihood that a participant chose to multitask (Wald  $\chi^2(2) = 6.264, p = .044$ ). Because we predicted that the active anxiety condition would be different than the passive anxiety and neutral conditions, we interpreted the data by testing two orthogonal contrasts (Judd, McClelland, and Ryan 2011): (contrast A) the difference between the active anxiety condition and the other two conditions, and (contrast B) the difference between the passive anxiety and neutral conditions. As predicted, actively anxious participants were more likely to multitask (60.49%) than both passively anxious participants (48.89%) and participants in the neutral emotion condition (41.84%; contrast A: Wald  $\chi^2(1) = 5.658, p = .017$ ). Passively anxious participants were no more likely to multitask than neutral participants (contrast B: Wald  $\chi^2(1) = .536, NS$ ). The results thus indicate that active anxiety increases efficiency seeking more than passive anxiety and neutral emotion. Also, as predicted, we found that although participants who chose to multitask took less time to complete the two tasks ( $M_{\text{multitasking}} = 119.67$  seconds vs.  $M_{\text{sequential-tasking}} = 141.74$

seconds,  $F(1, 273) = 6.5, p = .0114$ ), they also performed worse on the subsequent memory quiz ( $M_{\text{multitasking}} = 3.81$  vs.  $M_{\text{sequential-tasking}} = 4.08, F(1, 273) = 3.86, p = .050$ ).

This study provides initial support for our prediction that active anxiety increases efficiency seeking more than both passive anxiety and neutral emotion. We show that this need for efficiency under conditions of active anxiety manifests not just in a preference for multi-tasking, but also in faster completion of the tasks, albeit at the cost of accuracy. In the next study, we test if actively anxious participants also seek efficiency with money, as they do with time.

## Study 2

Whereas our first study found that being actively anxious makes consumers try to spend their time more efficiently, our second study tests whether active anxiety similarly makes consumers try to spend their money more efficiently. To do so, we examined how emotions influence the consumption of services when they are billed at a fixed rather than at a variable cost. When services are billed at a fixed cost, the price that consumers pay is independent of the number of units consumed. Consuming greater number of units, consequently, reduces the price paid per unit. That is, consuming more units gives consumers more “bang for their buck.” On the other hand, when services have a variable cost that depends on the number of units consumed, consuming greater number of units does not facilitate efficiency; the price paid per unit remains the same. Therefore, we measured efficiency seeking in this study by comparing how much food and drink

participants indicated they would consume if they had to pay a fixed price for unlimited consumption with how much they indicated they would consume if they had to pay a variable price for each item.

If active anxiety increases efficiency seeking, we should see a larger difference in consumption between the fixed cost “all-you-can-eat/drink” menu and the variable cost “pay-per-item” menu for participants who are actively anxious than for passively anxious or neutral participants. To test this, we experimentally manipulated participants’ emotion before asking them how many pizza slices or drinks they would like to consume. Additionally, we examined the extent to which participants’ choice intentions depended on whether they had ostensibly paid for unlimited servings or had to ostensibly pay for each slice of pizza or drink they consumed. Regardless of emotion, we expected that participants would consume more in the fixed cost condition than the variable cost condition; however, we predicted that the increase in consumption between the fixed and variable cost conditions would be larger when participants were actively anxious than when they were passively anxious or in a neutral emotional state.

## **Method**

Four hundred and thirty-two (239 males) participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. The experiment had a 3 (emotion: active anxiety, passive anxiety, neutral emotion) x 2

(payment option: fixed cost, variable cost) x 2 (choice replicate: pizza, drinks) between subject design.

The study contained two parts disguised as unrelated studies. In the first part, participants were randomly assigned to the emotion condition using the essay manipulation from study 1. After completing the emotion manipulation, participants proceeded to the second part of the study (see appendix B). Participants in the pizza condition were asked to imagine that they were at a pizza restaurant. In the fixed cost condition, participants read that they had paid \$12 for the pizza buffet and could eat as many slices as they wanted. In the variable cost condition, participants read that they could eat as many slices as they wanted for \$4 each. The dependent measure was how many slices of pizza participants said they would like to eat on a scale from 0 to 16+ slices. Similarly, participants in the drink condition were asked to imagine that they were at a party at a private venue. Participants in the fixed cost condition read that they had paid \$20 for an unlimited beverage package and could have as many drinks as they wanted, whereas those in the variable cost condition read that they could have as many drinks as they wanted for \$5 each. The dependent measure was how many drinks participants said they would like to consume on a scale from 0 to 10+ drinks.

After choosing how many servings they would like to eat or drink, participants also indicated how many slices of pizza they typically eat in a meal (0 to 16+) and how many drinks they typically have at a social gathering (0 to 10+). We used these measures as covariates in the pizza and drink conditions, respectively, in order to control for individual differences in appetite and thirst. Finally, participants indicated their gender,

age, whether or not they were trying to lose weight, and whether or not they had previously completed any of parts of the study before.

## Results

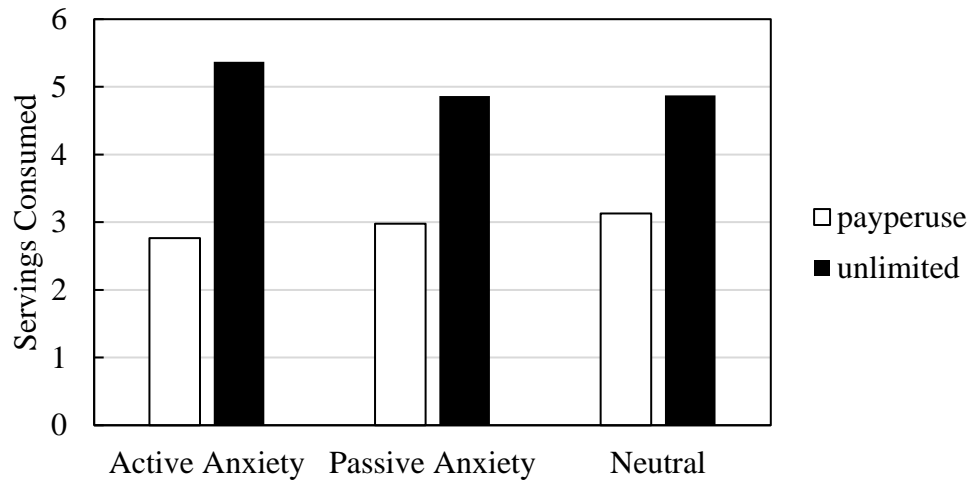
To test the effects of emotions on consumption, we conducted a 3 (emotion: active anxiety, passive anxiety, neutral emotion) x 2 (purchase option: fixed cost, variable cost) x 2 (replicate: pizza, drinks) between subjects ANCOVA, controlling for participants' baseline consumption of pizza and drinks. The effect of emotions on consumption in the fixed cost and the variable cost condition did not differ by replicate (three-way interaction,  $F(2, 419) = 1.13$ , NS). Furthermore, the two-way interaction between emotion and replicate ( $F(2, 431) = .61$ , NS) was also not significant. Thus, we collapsed the results across pizza and drinks.

As expected, participants chose to have more servings in the fixed cost condition, compared to the variable cost condition ( $F(1, 425) = 155.12$ ,  $p < .001$ ). But, consistent with our prediction, active anxiety increased the difference in consumption between the fixed cost condition and the variable cost condition ( $M_{\text{fixed}} = 5.37$  vs.  $M_{\text{variable}} = 2.77$ ) more than both passive anxiety ( $M_{\text{fixed}} = 4.86$  vs.  $M_{\text{variable}} = 2.98$ ) and neutral emotion ( $M_{\text{fixed}} = 4.87$  vs.  $M_{\text{variable}} = 3.13$ ; contrast A:  $F(1, 425) = 4.96$ ,  $p = .027$ ; see figure 2-1). This occurred because actively anxious participants consumed more in the fixed cost condition than both passively anxious and neutral participants (contrast A:  $F(1, 425) = 4.07$ ,  $p = .044$ ). Meanwhile consumption in variable cost condition was the same across

the active anxiety, passive anxiety and neutral conditions ( $F(1, 425) = 1.28, NS$ ). The difference between the fixed and variable cost conditions was similar for participants in the passive anxiety and neutral emotion conditions (contrast B:  $F(1, 425) = .12, NS$ ). Passive anxiety neither increased consumption in the fixed cost condition ( $F(1, 425) = .00, NS$ ), nor suppressed consumption in the variable cost condition ( $F(1, 425) = .29, NS$ ), more than the neutral emotion. Participants' baseline consumption of pizza and drinks also had an impact on consumption ( $F(1, 425) = 287.56, p < .0001$ ). The focal contrast remained significant when excluding the covariate from the analysis. Active anxiety increased the difference in consumption between the fixed cost condition and the variable cost condition ( $M_{\text{fixed}} = 5.46$  vs.  $M_{\text{variable}} = 2.29$ ), significantly more than both passive anxiety ( $M_{\text{fixed}} = 4.98$  vs.  $M_{\text{variable}} = 2.95$ ) and neutral emotion ( $M_{\text{fixed}} = 5.22$  vs.  $M_{\text{variable}} = 3.07$ ; contrast A:  $F(1, 427) = 5.42, p = .020$ ).

**FIGURE 2-1**

**STUDY 2: CONSUMPTION OF PIZZA AND DRINKS**



## **Discussion**

Study 2 demonstrates that active anxiety motives consumers to use their money efficiently, as it does with time (study 1). Actively anxious participants indicated they would consume more pizza slices at a fixed-cost all-you-can-eat buffet and more beverages after purchasing an unlimited-drinks package compared to participants who were passively anxious or in a neutral emotional state. On the other hand, when the price depends on the units consumed, active anxiety did not increase consumption relative to passive anxiety or no anxiety.

## **Study 3**

Study 3 examined how efficiency seeking among actively anxious participants influences preference for discounted products and discounted activities (i.e., activities that can be completed in less time than usual). Because active anxiety motivates efficiency seeking, it should increase preference for both discounted products and discounted activities more than passive anxiety and a neutral emotional state. To test this, we experimentally manipulated participants' emotional state before asking them to complete either a hypothetical shopping task or a hypothetical scheduling task. The shopping task included an assortment of products to choose from, whereas the scheduling task included an assortment of activities to choose from. In both tasks, the assortments contained a mix of discounted and undiscounted options. Furthermore, to



test whether the preference for discounts generalizes across different types of products and activities, the assortments contained a mix of both hedonic and utilitarian products and activities. We predicted that actively anxious participants would be more likely to select discounted products and activities, regardless of whether the products and activities were hedonic or utilitarian.

## **Method**

Two hundred and ninety-one undergraduate students at a Southwestern university in the United States completed a study in exchange for course credit. The experiment had a 3 (emotion: active anxiety, passive anxiety, neutral emotion) x 2 (task: shopping vs. scheduling) x 2 (replicate one, replicate two) x 2 (option cost: discounted, regular) x 2 (option benefit: hedonic, utilitarian) mixed design. The emotion, task, and replicate were manipulated between-subject. The option cost and option benefit were manipulated within-subjects.

The study contained two parts disguised as unrelated studies. In the first part, participants were randomly assigned to an emotion induction condition. After completing the emotion manipulation described in study 1, participants proceeded to the second part of the experiment, which was disguised as an unrelated study. Participants in the shopping condition chose products in a hypothetical shopping task, whereas participants in the scheduling condition chose activities in a hypothetical scheduling task.

In the shopping task, participants were shown eight different products worth \$32, and asked to choose a basket of products that cost no more than \$15 (see appendix B). Four of the eight products were hedonic: a box of donuts, Doritos, a movie DVD, and Oreo cookies. The other four products were utilitarian: a toothbrush, sunscreen, toilet paper, and Ziploc bags. Orthogonally, half of the products were listed as being on sale for an ostensibly discounted price. We-counterbalanced which items were discounted using two between-subject replicate conditions. In one of the replicate condition, Doritos, sunscreen, DVD, and Ziploc bags were offered at a discount, whereas the other products were not. In the other replicate condition, Oreo cookies, donuts, toilet paper, and toothbrush were offered at a discount, whereas the other products were not. Therefore, each product was listed on sale in one of the replicates, and listed at regular price in the other replicate. In actuality, we held the final price of each product constant across the two replicates, but varied the price before discount. For example, participants in replicate 1 read that the box of donuts is not on sale and costs \$5 and the movie DVD is on sale for \$6 instead of \$9. On the other hand, participants in replicate 2 read that the box of donuts is on sale for \$5 instead of \$8 and the movie DVD is not on sale and costs \$6.

The procedure in the scheduling condition was similar, except that instead of shopping for products while on budget, participants selected activities while having a time constraint. Participants read a list of activities that collectively required 300 minutes to complete and were asked to schedule activities they would like to complete in the next 120 minutes (see appendix B). Four of the eight activities were hedonic: browsing

updates on Facebook and other social media, catching up with friends over coffee or drinks, watching a TV show, and eating at your favorite restaurant. The other four activities were utilitarian: replying to work or school emails, doing an assignment, shopping for groceries, and doing laundry. Again, half of the activities could be completed in less time than normal, whereas the other four were not available at a time discount. We counterbalanced which items were discounted using two between-subjects replicate conditions. In one of the replicate condition, eating at a restaurant, replying to work email, catching up with friends over coffee, and shopping for groceries were offered at a discount, whereas the other activities were not. In the other replicate condition, browsing updates on social media, watching a TV show, doing laundry, and doing an assignment were offered at a discount, whereas the other activities were not. Therefore, each activity was listed on discount in one of the replicates, and listed at regular duration in the other replicate. In actuality, we held the final duration of each activity constant across the two replicates, but varied the duration before discount. For example, some participants read that the browsing Facebook and social media would take the usual 20 minutes, while catching up with friends would take 30 minutes instead of the usual 45 minutes. Other participants, read that browsing Facebook and social media would take 20 minutes instead of the usual 30 minutes, while catching up with friends would take the usual 30 minutes.

We measured preference for discounts by calculating the percentage of participants' total budget (time or money) that they spent on discounted options. Because discounts allow individuals to acquire products and complete activities with fewer

resources than the reference cost, we predicted that active anxiety would increase preference for discounts more than passive anxiety and neutral emotion. We similarly measured preference for hedonic options by calculating percentage of the money or time that participants allocated to the hedonic options, although we did not predict that participant's emotion would influence this measure.

## **Pretest**

We conducted a pretest with undergraduate students at a Southwestern university in the United States (N=120) to confirm that the hedonic products were associated with greater pleasure and the utilitarian products were associated with greater utility. Specifically, we asked participants to indicate to what extent they thought each of the products and activities seemed fun on a 5-point scale (1= Not at all fun, 5 = Very fun). We also asked participants to indicate to what extent they thought each of the products and activities seemed practical and necessary on a 5-point scale (1= Not at all practical and necessary, 5 = Very practical and necessary). As expected, the ratings of fun and practicality significantly differed across the hedonic and utilitarian products. Hedonic products were rated as being significantly more fun than utilitarian products, whereas utilitarian products were significantly more practical than hedonic products (all  $p$ 's < .05). Similarly, hedonic activities were significantly more fun than utilitarian activities, whereas utilitarian activities were significantly more practical than hedonic activities (all  $p$ 's < .05).

## Results

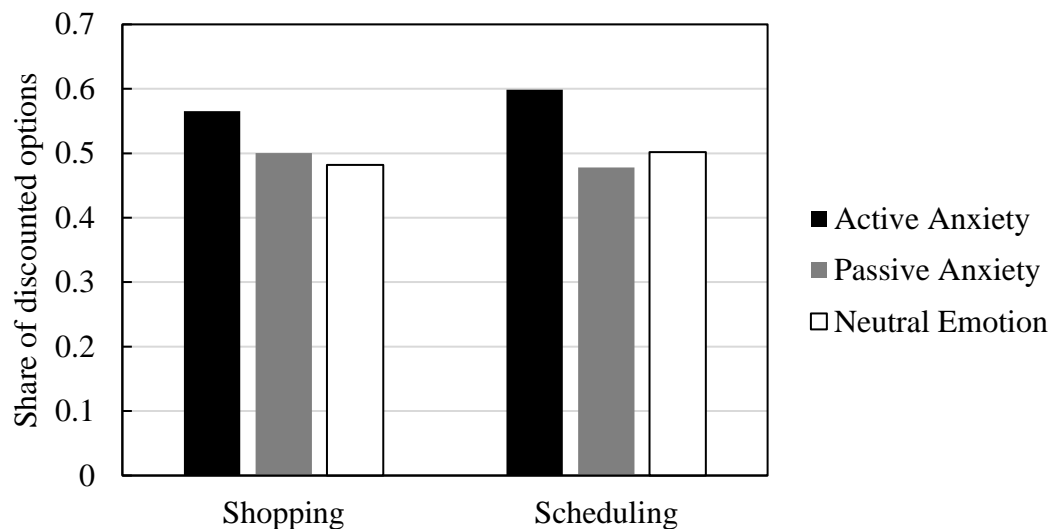
We examined participants' likelihood to select discounted products and activities in the shopping and the scheduling task using a 3 (emotion: active anxiety, passive anxiety, neutral emotion) x 2 (task: shopping vs. scheduling) x 2 (replicate one vs. replicate two) between-subjects ANOVA. The effect of emotions on the preference for discounts in the shopping task and the scheduling task did not differ by replicates (three-way interaction,  $F(2, 279) = .89$ , NS). Furthermore, the two-way interaction between emotion and replicate was also not significant ( $F(2, 279) = .74$ , NS). Thus, we collapsed the results across replicates.

In line with our predictions, active anxiety significantly influenced efficiency seeking, boosting both the share of discounted products selected in the shopping task and share of discounted activities in the scheduling task ( $F(2, 285) = 4.68$ ,  $p = .01$ ; see figure 2-2). Moreover, the effect of emotions was similar across the shopping task and the scheduling task (two-way interaction,  $F(2, 285) = .36$ , NS). As predicted, active anxiety increased the share of discounted options (57%) more than both passive anxiety (50%) and neutral emotion (48%; contrast A:  $F(1, 285) = 9.35$ ,  $p = .002$ ). Actively anxious shoppers selected more discounted products (57%) than both passively anxious (50%) and neutral shoppers (48%). Similarly, actively anxious participants selected more discounted activities (60%) than passively anxious participants (48%) and neutral participants (50%). On the other hand, passively anxious participants did not select any more discounted options than neutral participants (contrast B:  $F(1, 285) = .01$ , NS).

We further tested if actively anxious participants exhibited greater preference for utilitarian discounts and hedonic discounts. To do so we conducted a 3 (emotion: active anxiety, passive anxiety, neutral emotion) x 2 (task: shopping vs. scheduling) x 2 (product or activity type: hedonic, utilitarian; within-subjects) repeated-measures ANOVA. We measured preference for discounts across hedonic and utilitarian options by calculating the percentage of participants' total resource investment that they spent on hedonic discounted options, and on utilitarian discounted options. The data showed no evidence that the effect of active anxiety on preference for discounts is different across utilitarian options and hedonic options (two-way interaction;  $F(2, 285) = 2.14, p = .120$ ).

**FIGURE 2-2**

**STUDY 3: CHOICE OF DISCOUNTED OPTIONS**



## Discussion

Actively anxious shoppers were more likely to select products that cost less than usual, just as actively anxious schedulers were more likely to select activities that could be completed in less time than usual. These results replicate findings from previous studies. Importantly, we find that actively anxious participants are more likely to seek efficiency across both monetary as well as time resources. In the next study, we test whether anxiety increases efficiency seeking across a trade-off between time and money using a field experiment.

## Study 4

Study 4 examined whether experiencing active anxiety increases the tendency to select options offering a more efficient trade-off between money and time rather than options offering a higher total monetary pay-out. The study asked participants recruited on Mechanical Turk to choose between two studies that varied in their payment amount and length after writing essays that induced either active anxiety, passive anxiety, or neutral emotion. Although the longer study offered a higher payment (i.e., higher overall benefit) compared to the shorter study, it paid less money per minute (i.e., lower benefit per cost ratio), and therefore offered a less efficient cross resource trade-off than the shorter study. The study design lets us test whether active anxiety increases a general desire for money rather than a desire to efficiently use both time and money. If actively anxious participants want to maximize their financial resources, then they should be

more likely to select the better paying but less efficient study. Conversely, if actively anxious participants want to maximize efficiency, as we predict, then they should be more likely to select the lower paying but more efficient study.

## **Method**

Two hundred and fifteen participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. The experiment randomly assigned participants to one of three emotion conditions (active anxiety, passive anxiety, neutral emotion) in which they performed the same writing task as in study 1. After the writing task, participants chose between completing one of two ostentatiously unrelated bonus studies. They could either choose to complete a study that took 3 minutes and paid 30 cents (efficient study), or a long study that took 10 minutes and paid 50 cents (high pay study). The choice of the efficient study was coded as one, while choice of the high pay study was coded as zero.

## **Results and Discussion**

In line with our predictions, actively anxious participants were more likely to choose the efficient study (52.38%) than both passively anxious (35.13%) and neutral participants (33.33%) (contrast A: Wald  $\chi^2(1) = 6.031$ ,  $p = .014$ ). On the other hand, passively anxious participants were no more likely to choose the efficient study than



neutral participants (contrast B: Wald  $\chi^2(1) = .055$ , *NS*). This study shows that efficiency seeking increases actively anxious participants' likelihood of choosing activities that reward greater compensation per every unit of time. Just as active anxiety motivates consumers to spend time efficiently (study 1 and study 3) and money efficiently (study 2 and study 3), it also motivates them to efficiently exchange one resource for another by selecting an option that offers more money per unit of time.

### **Study 5**

Our studies thus far demonstrate that when consumers are anxious about poor goal progress, they try to use their time and money more efficiently in subsequent decisions. Active anxiety typically signals that a consumer has not progressed towards a goal quickly enough. The focus on slow goal progress prompts consumers to use their resources more efficiently, a strategy that makes sense as long as they perceive that they have a large enough store of resources to reach their goals. If resources are perceived to be scarce, however, then being efficient may not be sufficient; consumers will need to prioritize by focusing their limited resources on only their most important objectives (Fernbach et al. 2015; Shah, Shafir, and Mullainathan 2015; Spiller 2011). Therefore, when anxiety causes consumers to think about running out of resources, rather than about how their progress has been slower than expected, they should be more likely to prioritize their most important goals rather than trying to accomplish everything more efficiently. We thus predict that when anxious consumers focus on resource scarcity

rather than slow goal progress, they will be more likely to conserve resources for only their most important goals rather than spend them efficiently on less important pursuits.

How will the shift from seeking efficiency to conserving resources change the financial decisions that consumers make? In many situations, both the desire for efficiency and the desire to save money will motivate consumers to buy discounted products and avoid add-on fees. But in other situations, the desire to be efficient may conflict with the desire to save money. Consider an online retailer that offers free shipping to consumers who spend at least \$100, but otherwise charges a \$15 shipping fee. A consumer purchasing a \$50 pair of shoes can increase perceived efficiency by spending another \$50 on items that she doesn't really need in order to qualify for free shipping. However, doing so depletes the consumer's store of resources; the consumer could better save money by paying the \$15 shipping fee and saving the \$35 difference in price for more important expenditures. On the other hand, a consumer purchasing the \$50 pair of shoes can both increase efficiency and save money by waiting to place the order until she needs to buy something else that costs \$50, and then combining the two orders to get free shipping.

In study 5, we test this hypothesis. Specifically, we examine how being anxious about slow goal progress, anxious about resource scarcity, or not anxious influences when consumers try to avoid a shipping fee. When consumers can only avoid paying a shipping fee by making additional, unplanned purchases, we predict that consumers who are anxious about slow goal progress should be more likely to make the unplanned purchase than either consumers who are anxious about running out of resources or

consumers who are feeling neutral. This is because avoiding a shipping fee by making unplanned purchases increases the perceived efficiency of the transaction but fails to save money for more important expenses. Conversely, when consumers can avoid paying a shipping fee by delaying their purchase, we predict that both consumers who are anxious about running out of resources and consumers who are anxious about slow goal progress should be more likely to delay their purchase than neutral participants. In other words, relative to consumers in a neutral state, consumers anxious about slow goal progress should try to avoid the shipping fee regardless of whether or not this requires an unplanned purchase. Whereas consumers anxious about running out of resources should be more likely than neutral consumers to try to avoid the shipping fee only when doing so helps them save money, not when doing so requires making an unplanned purchase.

## **Method**

Three hundred and seventy-eight undergraduate students (186 males) at a Southwestern university in the United States completed a study in exchange for course credit. The experiment had a 3 (anxiety from slow progress vs. anxiety from scarcity vs. neutral emotion) x 2 (free shipping facilitates only efficiency vs. free shipping facilitates both efficiency and conservation) between-subjects design.

The study contained two parts disguised as unrelated studies. In the first part, participants engaged in a hypothetical shopping task. Participants imagined that they needed to buy a new pair of shoes and sunglasses. Next, they were directed to a screen

that simulated an online shopping website. They first viewed eight pairs of shoes costing \$59.99 each, and chose one. They next viewed eight pairs of sunglasses costing \$42.59 each, and chose one. After making their choice, participants were told that the shopping software needed some time to prepare their shopping carts. In the meantime, they were instructed to take the next study.

In the second study, we randomly assigned participants to an emotion condition. As in the previous studies, participants completed an essay-writing task. In both anxiety conditions, participants wrote about a goal that was causing them to feel anxious. In the slow goal progress condition, participants wrote about goals on which they were making slower than desirable progress (*Most individuals have a lot to be anxious about—exams, jobs, maintaining healthy weight, getting enough sleep, and other life goals which they have trouble attaining. Think of a couple of such goals that you're anxious about not attaining. Think specifically about the plans that you had made to reach these goals, and compare that with the progress you have made. Have you been making progress as fast as you'd intended?*). In the scarcity condition, participants wrote about whether or not they had sufficient time to successfully reach their goal (*Most individuals have a lot to be anxious about—exams, jobs, maintaining healthy weight, getting enough sleep, and other life goals which they have trouble attaining. Think of a couple of such goals that you're anxious about not attaining. Think specifically about how much time there is left for you to reach these goals, and the activities you need to do to reach these goals. Have you got enough time left to do all the activities you had planned?*). Similar to the previous studies, participants in the neutral emotion condition wrote about the different

sources they get information from, such as library services, internet articles, etc. Note that our anxiety manipulation specifically asked participants about pursuits on which they were anxious about running out time. Thus, the manipulation should induce anxiety about a resource (time) that is unrelated to the resource (money) that consumers needed to allocate in the choice task. This lets us explicitly test if the effect of feeling anxious about running out of time influences how consumers allocate a different type of resource: money.

After completing the emotion manipulation, participants returned to their shopping carts, which indicated that they had bought a pair of shoes worth \$59.99 and a pair of sunglasses worth \$42.59 for a total cost of \$102.98. Also, because their cart total exceeded \$100, participants were told that they qualified for free shipping. However, in a subsequent update, they were told that the sunglasses in their cart were out of stock, and, therefore, their new cart total was \$59.99. Because the new total was below \$100, they were informed that they did not qualify for free shipping any more. Participants were then offered a choice.

When free shipping only facilitated efficiency, participants were offered a choice between paying \$15 for shipping or purchasing an additional \$40 gift card for university merchandise in order to qualify for free shipping. Because the gift card allowed participants to avoid shipping costs, it facilitated efficiency. But, because the gift card is more expensive than the \$15 shipping fee, and because it is unplanned, buying it does not help participants save money. Analogously, when free shipping facilitated both efficiency and resource conservation, participants were offered a choice between placing

the order for just the shoes and paying \$15 for shipping, or alternatively placing the order for both the shoes and the sunglasses, and waiting for a month to receive both of the products. By placing the order for both the shoes and the sunglasses, participants were able to avoid paying the shipping fee (i.e., \$15). Thus, qualifying for free shipping by waiting for a month to receive the products allowed participants to both seek efficiency and save money.

## **Pretests**

We tested the effectiveness of the emotion manipulation by asking participants ( $N = 85$ ) to indicate how anxious, worried, nervous, negative and sad they felt on a 9-point scales (1 = not at all, 9 = very much) after completing the emotion manipulation. Ratings for “anxious”, “nervous”, and “worried” were averaged to form a composite score for anxiety (standardized  $\alpha = .941$ ), while ratings for “negative”, and “sad” (standardized  $\alpha = .852$ ) were averaged to form a composite score for overall negativity.

To examine the effects of emotions on the composite score of anxiety, we conducted a three condition (anxiety from slow progress, anxiety from scarcity, neutral emotion) between-subjects ANOVA. The results revealed the predicted main effect of emotion ( $F(2, 82) = 12.61, p < .0001$ ). Specifically, neutral participants ( $M = 1.844$ ) were less anxious than participants who were anxious about slow goal progress ( $M = 3.580; F(1, 82) = 12.61, p < .001$ ) and participants who were anxious about resource scarcity ( $M = 4.011; F(1, 82) = 22.75, p < .001$ ). Moreover, participants who were

anxious about slow goal progress felt just as anxious as participants who were anxious about resource scarcity ( $F(1, 82) = .76, NS$ ). Similarly, neutral participants ( $M = 1.719$ ) felt less negative than participants who were anxious about slow goal progress ( $M = 3.435$ ;  $F(1, 82) = 11.08, p < .01$ ) and participants who were anxious about resource scarcity ( $M = 3.467$ ;  $F(1, 82) = 13.30, p < .001$ ). Participants who were anxious about slow goal progress felt just as negative as participants who were anxious about resource scarcity ( $F(1, 82) = 0.00, NS$ ).

## **Results**

In line with our predictions, emotions had a significant effect on the choice of the option offering free shipping (Wald  $\chi^2(2) = 6.783, p = .038$ ). However this main effect was qualified by a marginally significant interaction between the emotion manipulation and the type of behavior that the efficient option facilitated (Wald  $\chi^2(2) = 4.930, p = .085$ ; see figure 2-3). In other words, the effect of emotion on the preference for free shipping depended on whether or not qualifying for free shipping helped participants save money.

Conceptually replicating our previous studies, the data revealed that participants who were anxious about slow goal progress were more likely to select the option offering free shipping even when it required them to spend money on an additional, unplanned purchase. Specifically, when participants were given the choice to pay \$15 for shipping or alternatively to add an unplanned and discretionary gift-card that cost

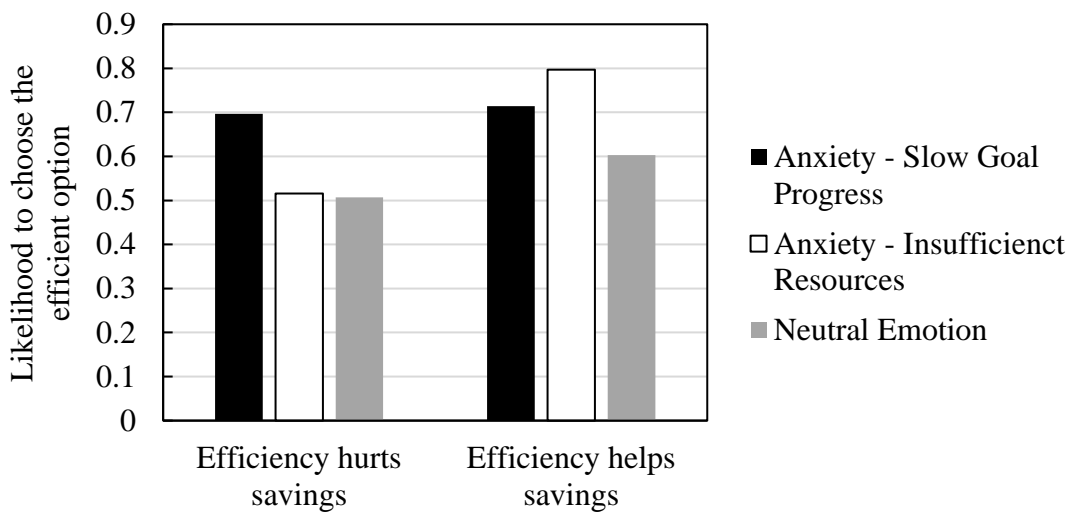
\$40 to qualify for free shipping, participants who were anxious about slow goal progress were more likely to buy the \$40 gift card (69.64%) than participants who felt anxious about insufficient resources (51.56%, Wald  $\chi^2(1) = 4.01, p = .045$ ) or felt neutral (50.72%; contrast: Wald  $\chi^2(1) = 4.51, p = .034$ ). Because buying this gift card allowed participants to qualify for free shipping, it facilitated efficiency but also hurt participants' monetary savings.

Interestingly, and consistent with our predictions, the data revealed a different pattern when participants could qualify for free shipping by waiting a month, a choice that facilitated both efficiency and savings. When participants were given the choice to pay \$15 for shipping to receive the shoes immediately or to wait for a month to avoid the shipping fee, both the participants who were anxious about slow goal progress (71.43%) and participants who were anxious about insufficient resources (79.66%) were more likely to choose to wait than participants who felt neutral (60.29%; contrast: Wald  $\chi^2(1) = 4.88, p = .027$ ).



**FIGURE 2-3**

**STUDY 5: PREFERENCE FOR FREE SHIPPING**



**Discussion**

The study tests an important boundary condition. Specifically, the effect of anxiety on efficiency seeking only occurs when anxious participants are focusing on slow goal progress rather than on running out of resources. Consistent with previous literature, we find that when individuals are anxious about running out of resources, they are more likely to conserve resources (Fernbach et al. 2015; Shah et al. 2015; Spiller 2011). Furthermore, we also demonstrate that when anxiety activates the desire to seek efficiency, and to conserve resources, it is fungible, and effects decisions related to resources other than those that are causing anxiety. Writing an essay about not having

enough time to attain a goal influenced how participants chose to spend their money in an unrelated shopping decision.

## **General Discussion**

Consumers spend their time and money differently when they are anxious about an approaching exam, work deadline, saving money for retirement or reaching any number of other goals. Across five experiments, we found that consumers who feel anxious about falling behind on one of their goals (i.e., active anxiety) allocate their time and their money more efficiently than both consumers who feel anxious about threats outside of their control (i.e., passive anxiety) and consumers in a neutral emotional state. Consumers who wrote about goals that make them anxious attempted to accomplish more in a set amount of time in subsequent decisions. Specifically, they were more likely to select activities that could be completed in less time than normal (study 3) and to complete multiple tasks at the same time rather than in succession (study 1). Actively anxious consumers similarly attempted to acquire more for a set amount of money in subsequent decisions. Specifically, they were more likely to select products that cost less money than normal (study 3), buy additional products to avoid paying a shipping fee (study 5), and consume a larger number of servings when paying a fixed price for all-you-can-eat or drink than when paying separately for each serving (study 2). Actively anxious mTurk workers even attempted to obtain a more efficient trade-off between time

and money by being more likely to complete a study that paid less overall but that offered a higher per-minute pay rate (study 4).

Importantly, consumers' efforts to be more efficient often come at a cost. By increasing efficiency seeking, active anxiety can result in consumers losing sight of the larger picture by causing them to focus on getting a good deal rather than on conserving or prioritizing their resources (Fernbach et al. 2015; Thaler 1985). Relative to passively anxious and neutral participants, actively anxious participants tried to use their time more efficiently by multi-tasking, which caused them to perform worse on the task than when they completed the tasks sequentially (study 1). Actively anxious participants similarly tried to spend their money efficiently by planning to eat more pizza (study 2), drink more beverages (study 2), purchase more discounted products (study 3), and make an unplanned, unnecessary purchase (study 5); it is unlikely that any of these decisions would help them save money or reach their most important goals, whatever they may be.

Our research has several important theoretical and practical implications. First, we contribute to the literature by demonstrating a new consequence associated with anxiety. When consumers are anxious about slow goal progress, they attempt to spend resources more efficiently. Thus, in addition to increasing the appraisals of uncertainty and lack of control (Smith and Ellsworth 1985; Tiedens and Linton 2001), inhibition motivation (Carver 2006; Schmeichel and Inzlicht 2013), and the desire to seek security (Raghunathan and Pham 1999), anxiety can increase efficiency seeking.

Another implication is that our research suggests that anxiety is not a unidimensional emotion, but can have different effects depending on whether a

consumer is anxious about something over which they have agency (i.e., active anxiety) or is beyond their control (i.e., passive anxiety). Specifically, feeling anxious about slow goal progress (e.g., an approaching deadline) prompts consumers to try to use their time and money more efficiently, but feeling anxious about external threats (e.g., terrorism) does not. Our research thus adds to recent work shows that the same emotional state can have different consequences, depending on why consumers experience the emotion. For example, being envious of a superior who deserves her good fortune (i.e., benign envy) results in a higher willingness to pay for products the superior owns, whereas being envious of an undeserving superior (i.e., malicious envy) results in a higher willingness to pay for products the superior doesn't own (Van de Ven, Zeelenberg, and Pieters 2011). Similarly, attributing pride to a specific behavior (e.g., I did well on the exam because I studied) is associated with higher levels of self-esteem, whereas attributing pride to a stable characteristic (e.g., I did well on the exam because I'm smart) is instead associated with higher levels of narcissism (Tracy and Robins 2007). Adding to this nascent literature, we show that active anxiety makes consumers try to use their time and money more efficiently but passive anxiety does not.

Finally, our research suggests important implications for consumers who are struggling to reach their goals. Our work suggests that feeling anxious about slow goal progress may trigger counter-productive behavior, like attempting to perform multiple activities simultaneously rather than accurately, selecting tasks based on how quickly they can be completed rather than on how important they are, overeating at an open table buffet, or buying useless products simply because they are on sale. Warning consumers

about these risks associated with active anxiety is the first step towards helping them curb these maladaptive behaviors. Our research also highlights a potential risk of setting ambitious goals. Monitoring progress towards goals can result in consumers experiencing higher levels of anxiety when the progress isn't going as well as planned. Although the anxiety from their goals may motivate them to catch up with their goals, it may also trigger less adaptive choices, like trying to read while driving or running up credit card debt on products discounted for Black Friday.

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# **CHAPTER 3**

## **HOW ANGER AND ANXIETY INFLUENCE CHOICE IN SELF-CONTROL DILEMMAS**

### **Introduction**

Consumers regularly experience negative emotions, from anger and fear to anxiety and despair. Americans are increasingly angry and anxious about corrupt government officials, terrorist attacks, identity theft, and economic collapse (Chapman University Survey of American Fears 2016). In fact, 43 percent of Americans suffer from moderate to high stress on a daily basis (Cohen and Janicki-Deverts 2012). Fearmongering by politicians and the media has only exacerbated anger and anxiety. According to the Esquire/NBC News Survey (2016), 49% of Americans experience more anger than they used to when thinking of current events and the news related to the 2016 presidential election.

The increased emotional baggage that consumers now carry begs an important question: How do negative emotions such as anger or anxiety influence choice in self-control dilemmas? Much of past literature suggests that negative emotions hurt self-control. Distress and sadness increases overspending (Cryder et al. 2008) and the consumption of unhealthy foods (Andrade 2005; Fedorikhin and Patrick 2010; Garg, Wansink, and Inman 2007). Negative emotions also trigger self-defeating behavior and cause relapse into unhealthy habits, such as smoking, excessive alcohol consumption,

and drug abuse (Cooper et al. 1995; Tice and Baumeister 1997).

Building on research suggesting that different emotions activate distinct needs (or goals) (Durante and Laran 2016; Lerner and Keltner 2000; Raghunathan and Pham 1999; Salerno, Laran, and Janiszewski 2014; Tooby and Cosmides 1990) that consumers try to satisfy by choosing means that are the most instrumental (Huang and Bargh 2014; Van Osselaer and Janiszewski 2012; Van Osselaer et al. 2005), we show that negative emotions do not have as straight-forward an effect on self-control (viz. impairment) as has been commonly argued in the past. Rather, we argue and demonstrate that the effect of negative emotions on choice in self-control dilemmas depends on whether the benefits associated with a virtuous option are aligned with the needs activated by the negative emotion (i.e., the instrumentality of the virtuous option).

Take, for example, a situation in which a consumer needs to save money, a goal that requires self-control. We argue that experiencing a negative emotion can either increase or decrease a consumer's likelihood of saving, depending on whether the benefits associated with the act of saving seem more or less instrumental to the needs activated by the specific emotion. Anger, for example, makes consumers want to be dominant (Tamir, Mitchell, and Gross 2008), whereas anxiety makes them want to be secure (Raghunathan, Pham, and Corfman 2006). Saving in order to buy the biggest house on the block would be consistent with a need for dominance, whereas saving money to build an emergency fund would be consistent with a need for security. Because anger activates a need for dominance, we argue that angry consumers are less likely to exert self-control when the savings are to be put into an emergency fund (a security

benefit) than when they are to be put aside to buy the biggest house on the block (a dominance benefit). On the other hand, because anxiety activates a need for security, anxious consumers tend to be less likely to exert self-control when they are saving money to buy the big house than when they are saving for emergencies.

Our research makes three important contributions. First, we contribute to our understanding of how negative emotions influence choices in self-control dilemmas. Specifically, we suggest that negative emotions impair self-control only when the benefits associated with the virtuous option are not instrumental to the needs activated by the negative emotion. Second, we suggest a new way of conceptualizing decisions in self-control dilemmas. Rather than viewing self-control as a choice between a gratifying option that provides an immediate benefit and a virtuous option that provides a long-term benefit, we show that both short-term and long-term benefits can facilitate different higher-order needs, such as dominance and security. Therefore, knowing whether a consumer is likely to select a virtuous option in a self-control dilemma requires not only understanding consumers' desire for immediate hedonic benefits (Baumeister 2002; Hoch and Loewenstein 1991), but also understanding consumers' other temporarily accessible needs and whether or not selecting the virtuous option facilitates these needs. Third, we show that instrumental benefits only increase the choice of virtuous options in the present, not in the future. By showing that that effect of emotions on choice in self-control dilemmas depends on the temporal distance to the behavior, we supplement an emerging line of work that helps explain how and when goal activation drives choice (Laran 2010; Laran, Janiszewski, and Cunha 2008).

## **Choice in Self Control Dilemmas**

A self-control dilemma involves a choice between a virtuous option (e.g., studying) promising long-term benefits and a gratifying option (e.g., watching TV) offering immediate pleasure (Hoch and Loewenstein 1991; Tice and Baumeister 1997). Consistent with much of the literature, we use self-control to refer to the decision to select a virtuous option offering long-term benefits over an immediately pleasurable gratifying option (Vosgerau, Scopelliti, and Eun Huh 2016). In contrast, self-control can alternatively refer to a resource (i.e., self-regulatory strength, or willpower) that consumers rely on to select the virtuous option in self-control dilemmas (Baumeister and Heatherton 1996). To be clear, we use self-control strictly to refer to the choice of a relatively virtuous option over a relatively gratifying option in a self-control dilemma.

We contend that the literature, which has conceptualized self-control dilemmas as a trade-off between immediate pleasure and long-term benefits, overlooks critical components of the choice dilemma. While gratifying options provide short-term benefits, and virtuous options provide long-term benefits, these benefits can in-turn satisfy different higher order needs. Because consumers choose the option that is most instrumental to their needs, consumers should be more likely to show self-control when the virtuous option is more aligned with their activated needs than the gratifying option (Huang and Bargh 2014; Kruglanski et al. 2002; Van Osselaer and Janiszewski 2012). Therefore, we conceptualize choice in a self-control dilemma as a function of consumers' active needs and the extent to which the gratifying and virtuous options are

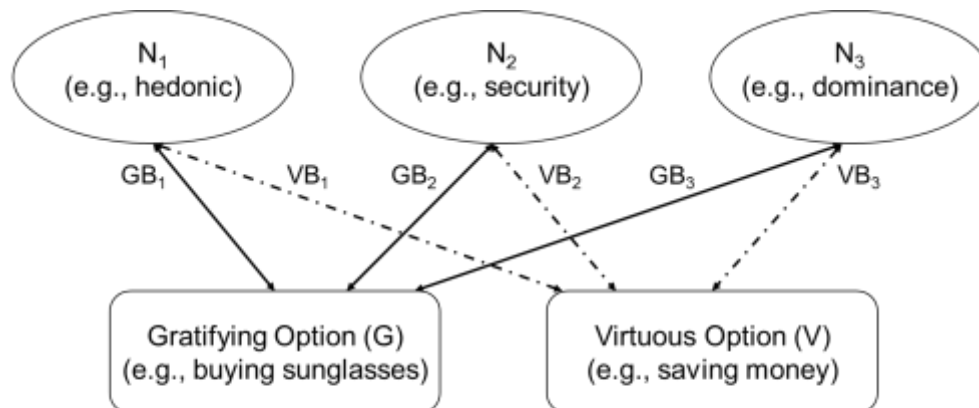


instrumental to these needs (Van Osselaer and Janiszewski 2012). Formally, a consumer selects the virtuous option (V) in a self-control dilemma when the sum of the activation of his or her needs ( $N_1, N_2, \dots, N_n$ ) multiplied by the instrumentality of the virtuous option to satisfy each of these needs ( $VB_1, VB_2, \dots, VB_n$ ) is greater than the sum of the activation of the consumer's needs multiplied by the instrumentality of the gratifying option to satisfy each of these needs ( $GB_1, GB_2, \dots, GB_n$ ; see figure 3-1):

$$(1) \sum_n (N_n * VB_n) > \sum_n (N_n * GB_n)$$

**FIGURE 3-1**

**NEEDS AND CHOICE IN SELF-CONTROL**



Select V if:  $\sum_n (N_n * VB_n) > \sum_n (N_n * GB_n)$

$N_n$  = the activation of need "n"

$GB_n$  = the extent to which the gratifying option is expected to benefit need "n"

$VB_n$  = the extent to which the virtuous option is expected to benefit need "n"

Consider the following example: John is deciding between buying an expensive pair of sunglasses (G) or saving money (V). The choice represents a typical self-control dilemma because John's desire for immediate pleasure (i.e., a hedonic need,  $N_1$ )

increases the likelihood of buying the sunglasses, as they would make John feel good now (i.e.,  $GB_1 > VB_1$ ). However, this discretionary purchase would also prevent him from saving money, which he could potentially use towards future needs. For instance, John could save for emergencies and satisfy a security need ( $N_2$ ) or save to buy the biggest house on the block and satisfy a dominance need ( $N_3$ ). Therefore, whether John decides to save money or buy the sunglasses depends not only on the strength of John's hedonic need ( $N_1$ ), which should decrease self-control (because  $GB_1 > VB_1$ ), but also the strength of his need for security ( $N_2$ ), the strength of his need for dominance ( $N_3$ ), and the extent to which John expects that financial savings, and sunglasses will make him feel better, more or less secure, and more or less dominant than saving money (i.e., the relative magnitude of  $GB_1$ ,  $VB_1$ ,  $GB_2$ ,  $VB_2$ ,  $GB_3$ , and  $VB_3$ ).

Viewing the effect of emotions on self-control through the lens of a goal-based model of choice, we can now examine how and when negative emotions influence self-control.

### **Different Emotions Activate Different Needs**

Emotions exert a large influence on judgments and decisions (Pham 2007). The effect of emotions can either be integral or incidental (Han, Lerner, and Keltner 2007). Our research focuses on incidental effects of emotions on self-control. Incidental effects refer to when an emotion elicited by a stimulus or experience influences unrelated judgments or decisions, such as when anxiety about an approaching flight alters what a

consumer decides to buy at the supermarket (Cavanaugh et al. 2007; Han et al. 2007).

According to a functionalist theory of emotions (Lerner and Keltner 2000; Raghunathan and Pham 1999; Tooby and Cosmides 1990), incidental effects of emotions occur because emotions activate distinct needs that can influence subsequent judgments and decisions (Carver 2006; Smith and Ellsworth 1985). Because negative emotions are aversive, consumers experiencing negative emotions want to feel better by regulating their negative feelings (Ochsner and Gross 2005; Schmeichel and Inzlicht 2013; Tice, Bratslavsky, and Baumeister 2001). One way that consumers can fulfill this hedonic need is by selecting a gratifying option over a virtuous one (because  $GB_1 > VB_1$ ). This is why sadness tends to increase the likelihood that a consumer eats unhealthy foods (Garg et al. 2007) and overspends on discretionary purchases (Cryder et al. 2008).

Negative emotions, however, can activate other needs (e.g.,  $N_2$ ,  $N_3$ ) in addition to hedonic pleasure (Tooby and Cosmides 1990). For instance, fear activates a need for self-protection (Griskevicius et al. 2009), disgust activates a need to avoid contaminants (Rozin, Haidt, and McCauley 2008), and sadness activates a need to avoid future losses (Salerno et al. 2014). Recent evidence suggests that such needs can in fact help individuals attain their long-term goals (i.e.,  $GB_n < VB_n$ ). Consequently, individuals often actively seek negative emotions to better deal with difficult situations. For instance, people prefer to be angry when entering confrontational contexts and prefer to be worried and afraid when attempting to avoid threats, such as failing on an exam (Tamir and Ford 2009; Tamir 2005; Tamir et al. 2008). These findings qualify prior

research on hedonic emotion regulation, which suggests that people in negative moods generally pursue behaviors that they think will improve their mood. But even though these findings suggest that negative emotions may not always hurt self-control, it is not well understood when negative emotions impair self-control and when they don't. With a few notable exceptions (Salerno et al. 2014), this question remains unanswered.

A goal-based model of self-control offers a promising framework for predicting how negative emotions influence choices in self-control dilemmas. First, a goal-based model predicts that just as increasing the strength of a hedonic need decreases self-control (Ochsner and Gross 2005; Tice et al. 2001), increasing the strength of a need that is more strongly associated with the virtuous option can enhance self-control. For example, priming a need to avoid future losses, which the virtuous option satisfies more than the gratifying option, improves self-control among sad consumers (Salerno et al. 2014).

A goal-based model also points to a new prediction: increasing the instrumentality of the virtuous option (i.e., increasing  $VB_n$ ), or decreasing the instrumentality of the gratifying option (i.e., decreasing  $GB_n$ ), towards a need activated by the emotion should improve self-control. We next discuss how virtuous and gratifying options can be made more or less instrumental to the needs activated by two negative emotions, anxiety and anger.

## **Needs Activated by Anger and Anxiety**

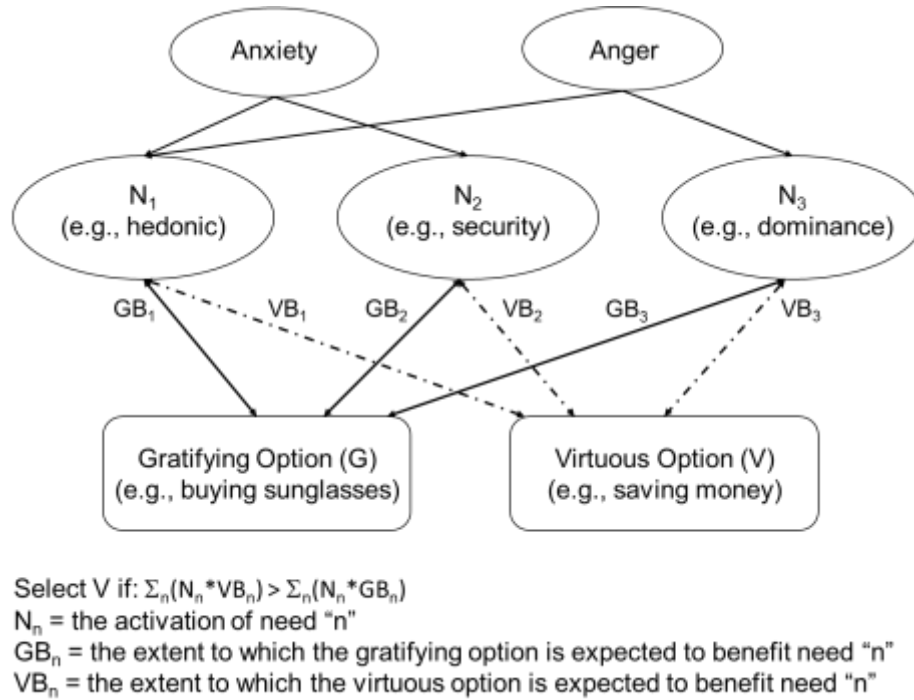
Like other emotions, anxiety and anger evolved to help humans cope with problems of survival and reproductive success (Mauss et al. 2005). Anxiety occurs when people recognize a distant threat or the possibility of not reaching a goal. For example, an airline passenger might be anxious about the plane crashing, whereas a student might be anxious about not passing an exam. Anxiety alerts individuals to threats and potential goal failures (Schmeichel and Inzlicht 2013) and helps get them back on track by activating a need to seek security (Lench et al. 2014; Raghunathan et al. 2006). This need for security spills over to unrelated decisions by increasing the preference for options that offer greater safety and control (Raghunathan et al. 2006).

Anger, on the other hand, is experienced when the pursuit of a reward is disrupted due to wrongful interference (Chow, Tiedens, and Govan 2008; Kashdan et al. 2015). For example, a student might be angry about an unfair exam question, a consumer might be angry about being charged a higher price than others, and a worker might be angry about not receiving an expected raise. The situations that trigger anger present an obstacle that individuals want to overcome. Unlike the situations that cause anxiety, the situations that cause anger are also perceived as unfair, undeserved, and caused by unjust actions of other individuals or institutions (Pillutla and Murnighan 1996). Overcoming these obstacles requires the exertion of dominance, which refers to the ability to acquire rewards or valued resources in the presence of others (Emerson 1962). Consistently, research shows that individuals prefer to seek anger in confrontational situations (Tamir

et al. 2008). Relatedly, anger tends to increase sensitivity to rewards but not sensitivity to threats (Carver and Harmon-Jones 2009), and dominance offers a better means of acquiring rewards than of reducing threats.

In sum, the literature predicts that negative emotions, including anger and anxiety, increases a hedonic need. We predict that in addition to increasing a hedonic need, anxiety will increase a need for security whereas anger will increase a need for dominance (see figure 3-2).

**FIGURE 3-2**  
**EMOTIONS AND CHOICE IN SELF-CONTROL**



By integrating predictions about the distinct needs activated by anxiety and anger with a goal based choice model, we make three new predictions. One, consumers should

be more likely to choose the virtuous option when the benefits of the virtuous option in a self-control dilemma are more instrumental to the need activated by the consumers' emotional state. Because anxiety activates a security need, we hypothesize that anxious consumers should be more likely to exert self-control when the virtuous option (e.g., studying) in a self-control dilemma is associated with a security (e.g., getting a secure job) rather than a dominance benefit (e.g., getting a prestigious job). On the other hand, because anger activates a dominance need, angry consumers should be more likely to exert self-control when the virtuous option is associated with a dominance rather than a security benefit.

**H1:** Emotional consumers are more likely to show self-control when the virtuous option in the choice set is more instrumental to the needs activated by the consumers' emotional state (see figure 3-3).

Two, just as self-control can be improved when the benefit of the virtuous option is instrumental towards consumers' active needs, it can also be impaired when the benefit of the gratifying option is instrumental towards the active needs. Consider a consumer who is trying to save money and is confronted with an opportunity to purchase an additional pair of sunglasses. In addition to offering a hedonic benefit, the gratifying purchase of the sunglasses could also potentially satisfy a need for security (e.g., UV ray protection), or a need for dominance (e.g., if the brand signals status and prestige). Consequently, we hypothesize that anxious consumers should be less likely to exert self-control when the gratifying option is associated with security rather than dominance

benefits, whereas angry consumers should be less likely to exert self-control when the gratifying option is associated with dominance rather than security benefits.

**H2:** Emotional consumers are less likely to show self-control when the gratifying option in the choice set is more instrumental to the needs activated by the consumers' emotional state (see figure 3-3).

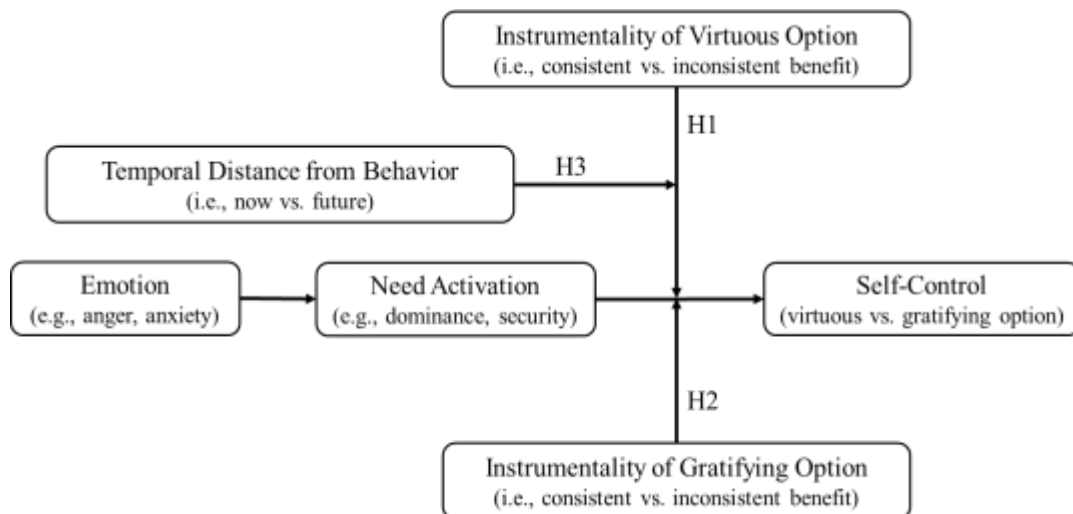
Our third prediction identifies a boundary condition for when the instrumentality of the virtuous and gratifying options are likely to drive choice in self-control dilemmas. Increasing the activation of a need increases the selection of the instrumental option in common or typical contexts (e.g., Chartrand et al. 2008), but it is less likely to increase the selection of the instrumental option in uncommon or atypical contexts (Laran et al. 2008). For example, participants primed with a hedonic need were more likely to select a fun gift over a sophisticated gift when the gift was for the participant's father (a common choice context) but less likely to select the fun gift for a friend's father (an uncommon choice context; Laran et al., 2008). An important factor influencing the typicality of a choice context is whether the decision concerns the present (or near future) or concerns the distant future (Laran 2010; Laran et al. 2008). Choosing where to dine tonight is more common than choosing where to dine in a month, just as deciding how much money to save this month is more common than deciding how much money to save in the same month next year. Consequently, since choices concerning the distant future are less typical, active needs are more likely to influence decisions about what to do now than decisions about what to do in the distant future (Carlson, Meloy, and Miller 2013; Fishbach and Dhar 2005; Laran 2010; Laran et al. 2008).



It follows that the needs activated by emotions should have a larger effect on self-control decisions concerning the present (e.g., saving vs. spending money now) than those concerning the future (e.g., saving vs. spending money next year). Consequently, we predict that temporal distance will moderate the effect of instrumentality on choice in self-control dilemmas. That is, anxiety should increase the choice of a virtuous option offering a security rather than a dominance benefit when deciding what to do now, but not when deciding what to do in the distant future. Analogously, anger should increase the choice of a virtuous option offering a dominance rather than a security benefit when deciding what to do now, but not when deciding what to do in the distant future.

**H3:** Temporal distance moderates the effect of instrumentality on self-control (see figure 3-3).

**FIGURE 3-3**  
**CONCEPTUAL MODEL**



## **Study 1**

Our core argument is that increasing the instrumentality of the virtuous option towards the needs activated by anger and anxiety can increase self-control among angry and anxious individuals. Study 1 manipulates anxiety and anger, which we predict will activate the needs for security ( $N_2$ ) and dominance ( $N_3$ ), respectively. Study 1 additionally manipulates the instrumentality of the virtuous option (i.e., studying for a job interview) by varying whether studying benefits security (i.e.,  $VB_2$  is high) or dominance (i.e.,  $VB_3$  is high). The study thus tests H1 by exploring if anxiety is less likely to impair self-control when studying is described as a means of getting a secure rather than a prestigious job (i.e., when  $VB_2$  is increased), but if anger is less likely to impair self-control when studying is described as a means of getting a prestigious rather than a secure job (i.e., when  $VB_3$  is increased).

## **Method**

One hundred and thirty-four undergraduate students at a Southwestern university in the United States completed the study in return for course credit. For this and subsequent studies we made an a priori decision to filter out respondents who had previously completed all or part of the study beforehand (see appendix D for detailed filtering criteria). The sample sizes reported in each of the studies are the final samples after removing participants who did not qualify. The study had a 3 (emotion: anxiety vs.

anger vs. neutral) x 2 (benefit: security vs. dominance) between-subjects design.

The study contained two parts described as unrelated studies. In the first part, participants were randomly assigned to an emotion condition. Depending on their randomly assigned emotion condition, participants wrote essays about events that make them feel anxious, events that make them feel angry, or activities that they had done that day (neutral condition), under the pretext that the study was designed to examine students' lives (Lerner and Keltner 2001; Winterich and Haws 2011). Participants were first asked to write about three to five experiences or events that make them anxious (anxiety condition), three to five experiences or events that make them angry (anger condition), or three to five activities that they had done that day (neutral condition). Participants subsequently described the experience, event, or activity that makes them the most anxious, the most angry, or that they completed the most recently (neutral condition).

As an ostensibly separate study, participants next selected an article to read. They had a choice between reading a relatively virtuous technical article on how to improve their performance in job interviews or reading a relatively gratifying article that contained comedic banter and humorous cartoons (see appendix F for the stimuli). Furthermore, we varied whether the virtuous option (i.e., the job interview article) was associated with a security benefit (*A good job provides you a great deal of safety and security. People with good jobs are less likely to be laid off during turbulent times and are more protected from social, physical, and financial problems that afflict people who don't have a good job*), or a dominance benefit (*A good job allows you to exercise a*

*great deal of influence and power. People with good jobs get to make important strategic decisions at work and acquire far more wealth and status than people who don't have a good job).*

We measured self-control using a binary choice between reading the job interview article (coded as 1) and the entertaining article (coded as 0). After reading their selected article, participants indicated if and when they were planning to start looking for jobs (1 = I will start looking for a job/internship before the end of this semester; 2 = I will start looking for a job/internship before the end of this semester ... 6 = I will start looking for a job/internship in the next spring (2018) semester; 7 = I do not plan to look for a job/internship; 8 = I already have a job/internship), their gender, and whether or not they had previously completed any of the parts of the study. Because the choice between the job interview article and the entertainment article poses a self-control dilemma only for participants who are looking for a job, we filtered out participants who said that they weren't looking for a job (i.e., those who indicated that they already have a job, or are not planning to seek a job; 29.5% of the sample). We report the results with the full sample in appendix E.

## **Pretests**

We conducted pretests with independent samples both to confirm that participants experienced the choice as a self-control dilemma and that the writing task effectively manipulated participants' emotions. To test the articles in the choice set, we

asked participants ( $N = 27$ ) to indicate when they thought they would receive the benefits of “reading an article that helps prepare for job or internship interview”, and “reading an entertaining article” on a 6-point scale (1 = Right away, 2 = Within a week, 3 = In a few weeks, 4 = In a few months, 5 = In a year, 6 = After a few years). They were also asked to indicate the self-control required for “reading an article that helps prepare for job or internship interview”, and for “reading an entertaining article” on a 5-point scale (1 = None, 5 = A lot). As expected, “reading an article that helps prepare for job or internship interview” was associated with longer term benefits ( $M = 2.81$ ) than “reading an entertaining article” ( $M = 1.37$ ,  $p < .001$ ) and was perceived to require greater self-control ( $M = 2.30$ ) than “reading an entertaining article” ( $M = 1.44$ ,  $p < .001$ ).

We also tested the effectiveness of the emotion manipulation by asking participants ( $N = 181$ ) to indicate how anxious, worried, nervous, angry, frustrated, sad and negative they felt on a 9-point scales (1 = not at all, 9 = very much) after completing the emotion manipulation. Ratings for “anxious”, “worried”, and “nervous” were averaged to form a composite score for anxiety (standardized  $\alpha = .89$ ), while ratings for “angry” and “frustrated” were averaged to form a composite score for anger ( $r = .80$ ). Ratings for “negative”, and “sad” were averaged to form a composite score for negativity ( $r = .66$ ).

To examine the effects of emotions on the ratings of anger and anxiety, we conducted a 2 (ratings: anger, anxiety)  $\times$  3 (emotion: anger, anxiety, neutral) repeated-measures ANOVA using ratings as a within-subjects factor and emotion as a between-

subjects factor. The results revealed the predicted interaction between ratings and emotion ( $F(2, 178) = 13.52, p < .001$ ). Specifically, angry participants ( $M = 3.21$ ) were more angry than anxious ( $M = 2.65; F(1, 178) = 4.10, p < .05$ ) and neutral participants ( $M = 1.83; F(1, 178) = 23.36, p < .0001$ ). On the other hand, anxious participants ( $M = 3.72$ ) were more anxious than angry ( $M = 3.02; F(1, 178) = 7.32, p < .01$ ) and neutral participants ( $M = 2.80; F(1, 178) = 12.48, p < .001$ ). Finally, a between-subjects (emotion: anger, anxiety, neutral) ANOVA revealed that emotion condition also influenced overall negativity ( $F(2, 178) = 4.04, p < .05$ ). Participants in the neutral condition felt significantly less negative ( $M_{\text{neutral}} = 1.97$ ) than those in the anxiety condition ( $M_{\text{anxiety}} = 2.64; F(1, 178) = 6.60, p < .05$ ) and anger condition ( $M_{\text{anger}} = 2.60; F(1, 178) = 5.64, p < .05$ ). Participants in anger and anxiety condition did not differ in negativity ( $F(1, 178) = 0.03, \text{NS}$ ).

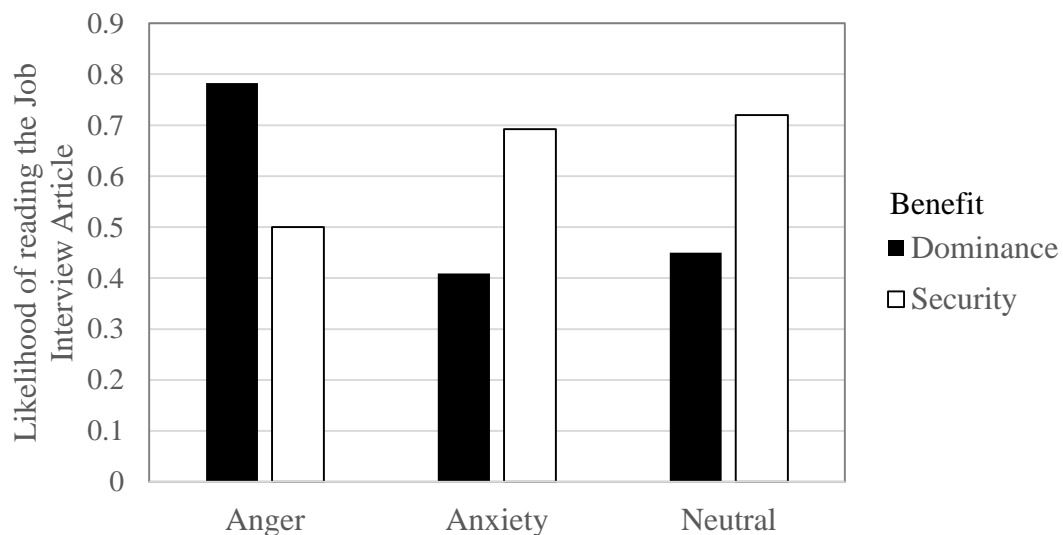
## Results

To test the effects of emotions on self-control, we conducted a 3 (Emotion: anger, anxiety, and neutral)  $\times$  2 (Benefit: security, dominance) between-subjects logistic regression. The effect of the emotion manipulation on self-control depended on whether participants read that jobs provide dominance or that jobs provide security (two-way interaction: Wald  $\chi^2(2) = 8.917; p = .012$ ; see figure 3-4). In line with our prediction, emotions increased self-control when jobs were associated with a more instrumental benefit rather than a less instrumental benefit. Specifically, angry participants were marginally more likely to choose the job-interview article over the entertaining article

when jobs were described as a path to greater influence (78%) rather than security (50%, Wald  $\chi^2(1) = 3.434$ ;  $p = .064$ ). Conversely, anxious participants were marginally more likely to choose the job interview article over the entertaining article when jobs were described as a path to security (69%) rather than influence (41%, Wald  $\chi^2(1) = 3.769$ ;  $p = .052$ ). Participants in the neutral condition, also exhibited marginally less self-control when jobs were described as a means to dominance (45%) rather than security (72%, Wald  $\chi^2(1) = 3.275$ ;  $p = .070$ ). We are hesitant to interpret the marginally significant effect of the benefit manipulation in the neutral emotion condition both because we did not predict this effect and because we do not observe a similar pattern in subsequent studies.

**FIGURE 3-4**

**STUDY 1: LIKELIHOOD TO READ THE VIRTUOUS ARTICLE**



## **Discussion**

Study 1 shows that individuals exert more self-control when the virtuous option is more instrumental, and therefore, offers a benefit that is consistent, rather than inconsistent, with the need activated by the participant's emotional state. Specifically, anxiety led to a higher likelihood of reading a relatively virtuous job interview article when jobs were described as providing security rather than dominance. Conversely, anger increased the likelihood of reading the job interview article when jobs were described as providing dominance rather than security. By using a real self-control dilemma relevant to the student participants (i.e., reading a virtuous article related to job-interviews vs. an enjoyable article with cartoons), the study offers initial evidence that the effects of anger and anxiety on self-control depend on the benefits of the virtuous option in the choice set. The study, however, did not directly assess whether the needs for security and dominance mediated the observed effects. We test this hypothesized mediating process in studies 2a and 2b.

## **Study 2**

Studies 2a and 2b use a causal-chain approach (Spencer, Zanna, and Fong 2005) to provide evidence of the mediating process. Study 2a uses a lexical decision to assess whether anxiety activates a need for security ( $N_2$ ) and whether anger activates a need for dominance ( $N_3$ ). The task measures participants' response time to sentences related to



security (e.g., “Seek shelter during tornadoes”) and dominance (e.g., “The captain gave orders”). The greater the activation of the need, the faster the participants’ ability to identify sentences associated with that need (Belei et al. 2012; Fishbach, Friedman, and Kruglanski 2003). Thus, we predicted that anxious participants would identify sentences related to security faster than participants who aren’t anxious, but that angry participants would identify sentences related to dominance faster than participants who aren’t angry.

Study 2b tested the next part of the process by directly priming the need for security ( $N_2$ ) or dominance ( $N_3$ ) while orthogonally manipulating whether the virtuous option benefits security ( $VB_2$ ) or dominance ( $VB_3$ ) to explore whether self-control is higher when the benefits associated with the virtuous option match the consumer’s active need (i.e., when the instrumentality of the virtuous option is higher). We predicted that individuals primed with dominance would be more likely to exert self-control when the virtuous option provides a dominance benefit rather than a security benefit. On the other hand, we predicted that individuals primed with security would be more likely to exert self-control when the virtuous option provides a security benefit rather than a dominance benefit.

### **Study 2a: Method**

Two hundred twenty undergraduate students at a Southwestern university in the United States completed the study for course credit. Participants were randomly assigned to one of three conditions (“anger,” “anxiety,” or “neutral” emotion) in which they

performed the same writing task as in Study 1. After the writing task, participants completed an ostensibly unrelated study, which required them to respond to a lexical decision task. In this task, participants saw a fixation cross for one second before viewing a string of four words on the computer screen. Participants needed to indicate whether the string of words was a legitimate English sentence (by pressing the “Q” key) or not (by pressing the “P” key) as quickly and accurately as possible. Participants viewed four word sets in a practice round and eighteen word sets in the focal round. In the focal round, participants saw nine illegitimate sentences (e.g., “Not machine working is”), five legitimate sentences unrelated to dominance or security (e.g., “They organized the event”), two legitimate sentences related to security (“Seek shelter during tornadoes” and “Try to comfort her”), and two legitimate sentences related to dominance (“She dominates the tournament” and “The captain gave orders”) in random order. Response times were recorded in milliseconds. Following standard practice, we used only the correct responses and removed responses that had latencies more than three standard deviations away from the means (Belei et al. 2012; Fazio 1990). We averaged and log-transformed the response times for security, dominance, and neutral sentences for the statistical analyses to normalize the distribution of the reaction time data (Whelan 2008); however, we report the untransformed response-times for ease of interpretation.

### **Study 2a: Pretest**

We conducted a pretest to confirm that security related sentences were indeed

perceived to be more associated with security than dominance, while the dominance related sentences were perceived to be associated more with dominance than with security. To test the sentences, we asked participants ( $N = 90$ ) to indicate how strongly they associated the sentence with “security” and “dominance” on a 5-point scale (1 = Absolutely Not, 2 = Mostly Not, 3 = Somewhat, 4 = Mostly Yes, 5 = Definitely Yes). As expected, sentences related to dominance were rated higher on dominance ( $M = 5.48$ ) than sentences related to security ( $M = 2.11$ ,  $t(89) = 20.00$ ,  $p < .0001$ ). Conversely, sentences related to security were rated higher on security ( $M = 4.31$ ) than sentences related to dominance ( $M = 3.02$ ,  $t(89) = 7.03$ ,  $p < .0001$ ).

## **Study 2a: Results**

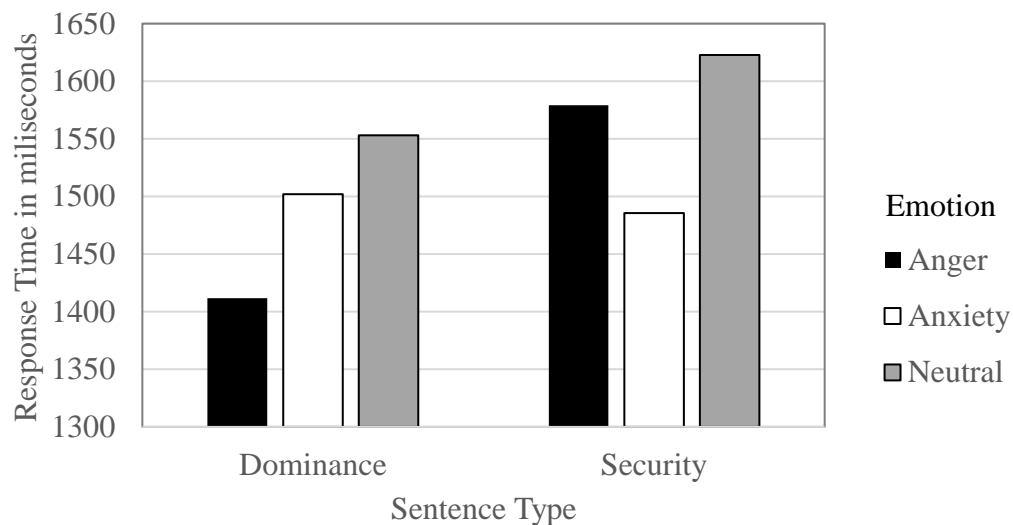
To test the effects of emotions on response times, we conducted a 2 (sentence type: security, dominance; within-subjects)  $\times$  3 (emotion: anger, anxiety, control; between-subjects) repeated-measures ANOVA. We controlled for participants’ average response times on neutral sentences as a proxy for their baseline response speeds (Touré-Tillery and Fishbach 2012).

The results revealed a significant interaction between sentence type and emotion ( $F(2, 216) = 4.09$ ,  $p = .018$ ; see figure 3-5). Specifically, angry participants were faster at responding to dominance related sentences ( $M = 1411.73$  milliseconds) than participants in the neutral condition ( $M = 1553.06$  milliseconds;  $F(1, 216) = 6.19$ ,  $p = .014$ ) and marginally faster than participants in the anxiety condition ( $M = 1501.99$  milliseconds;

$F(1, 216) = 2.93, p = .088$ ). On the other hand, anxious participants were faster at responding to security related sentences ( $M = 1485.51$  milliseconds) than participants in the neutral condition ( $M = 1622.72$  milliseconds;  $F(1, 216) = 5.33, p = .022$ ) and marginally faster than participants in the anger condition ( $M = 1579.21$  milliseconds;  $F(1, 216) = 2.72, p = .100$ ). The results confirm that anger increases the accessibility of dominance whereas anxiety increases the accessibility of security.

**FIGURE 3-5**

**STUDY 2A: RESPONSE TIME IN THE LEXICAL DECISION TASK**



**Study 2b: Method**

One hundred seventy-nine undergraduate students at a Southwestern university in the United States participated in the study for credits. The experiment had a 2 (activated need: dominance vs. security) x 3 (benefit: security vs. dominance vs. neutral) between-

subject design. The study contained two parts disguised as unrelated studies. In the first part, participants were randomly assigned to a need condition. We used the scrambled sentence task, an established priming technique, to activate security and dominance needs (Bargh and Chartrand 1999). The task required participants to unscramble a string of five words to create a grammatically correct English sentence. In each condition participants saw twenty sets of words. In the dominance condition, eight of the twenty sets could be successfully unscrambled to form a sentence related to dominance (e.g., “Captain gave the orders”). In the security condition, eight of the twenty sets could be successfully unscrambled to form a sentence related to security (e.g., “Seek shelter during tornadoes”) (see appendix F). The remaining twelve sets in each of the conditions could be unscrambled to form a neutral sentence. These twelve sentences were neutral fillers and were included to reduce suspicion about the priming technique. After completing the scrambled-sentence task, participants completed an ostensibly separate study on reading preferences. As in study 1, participants chose whether to read a technical article about job interviews or a more pleasurable article that contained comedic banter and humorous cartoons. Similar to study 1, participants read that landing a job benefits dominance, security, or neither, depending on the benefit condition (see appendix F for stimuli). In addition to the dominance and security benefit conditions described in study 1, we also included a neutral condition in which participants were simply told that good job allow individuals to lead a pleasant life. Finally, after reading their selected article, participants indicated whether they were looking for a job (1 = absolutely not; 7 = absolutely yes).

## **Study 2b: Pretest**

We conducted pretests to confirm that the security sentences were perceived to be more associated with security than dominance, while the dominance sentences were perceived to be more associated with dominance than security. The pretest asked participants ( $N = 90$ ) to indicate how strongly they associated the sentence with “security” and “dominance” on a 5-point scale (1 = Absolutely Not, 2 = Mostly Not, 3 = Somewhat, 4 = Mostly Yes, 5 = Definitely Yes). We computed the average security and dominance ratings for security related sentences, dominance related sentences, and neutral sentences. As expected, sentences related to dominance were rated higher on dominance ( $M = 3.75$ ) than sentences related to security ( $M = 2.02$ ,  $t(89) = 17.02$ ,  $p < .001$ ) and neutral sentences ( $M = 1.58$ ,  $t(89) = 25.39$ ,  $p < .001$ ). Conversely, sentences related to security were rated higher on security ( $M = 3.34$ ) than sentences related to dominance ( $M = 2.86$ ,  $t(89) = 4.68$ ,  $p < .0001$ ) and neutral sentences ( $M = 1.73$ ,  $t(89) = 18.44$ ,  $p < .001$ ).

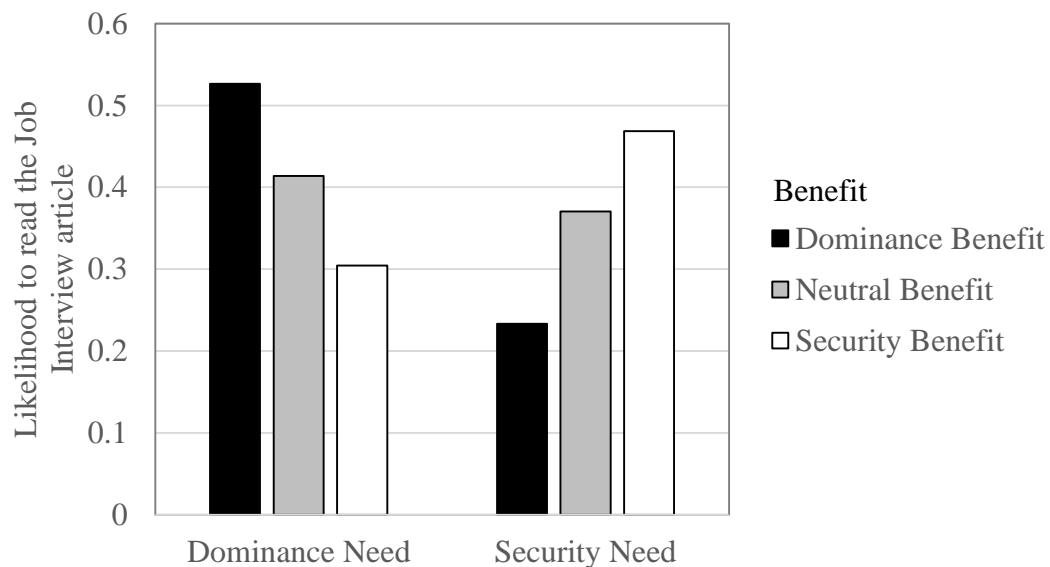
## **Study 2b: Results**

To test the effects of emotions on self-control, we conducted a 2 (need: security, dominance)  $\times$  3 (benefit: security, dominance, neutral) between-subjects logistic regression. In line with our predictions, the effect of the need manipulation on self-control depended on whether jobs were associated with dominance or security (Wald

$\chi^2(2) = 6.47; p = .039$ ; see figure 3-6). Participants in the dominance condition were most likely to choose the job interview article over the entertaining article when jobs were described as a means to dominance (52.6%), next most likely in the neutral benefit condition (41.4%), and the least likely when jobs were described as a means to security (30.4%; Cochran-Armitage Trend Test  $Z(1) = 1.715; p = .043$ ). Conversely, participants in the security condition were most likely to choose the job-interview article over the entertaining article when jobs were described as a means to security (46.9%), next most likely in the neutral benefit condition (37%), and the least likely when jobs were described as a means to dominance (23.3%; Cochran-Armitage Trend Test  $z(1) = -1.928; p = .027$ ). In sum, need activation increased self-control when jobs were associated with a consistent benefit rather than an inconsistent benefit.

**FIGURE 3-6**

**STUDY 2B: LIKELIHOOD TO READ THE VIRTUOUS ARTICLE**



## **Discussion**

Collectively, studies 2a and 2b suggest that the effect of an emotion on self-control depends on the instrumentality of the virtuous option in a self-control dilemma (H1) and that the specific needs activated by the emotion mediate this effect. Different emotions activate different needs (study 2a), which in turn increase self-control when the virtuous option benefits the activated need (study 2b). To provide further evidence for the process, in the next study we show that anger and anxiety not only enhance self-control when there is a match between the activated need and the virtuous option, but also impair self-control when there is a match between the activated need and the gratifying option.

## **Study 3**

Study 3 extends the previous studies by examining how the instrumentality of the gratifying option, rather than the instrumentality of the virtuous option, influences self-control (H2). Because emotions increase the choice of the option that best facilitates the need activated by the emotion, choices in self-control dilemmas should depend not only on the instrumentality of the virtuous option but also the instrumentality of the gratifying option. Specifically, although anger should increase self-control when the virtuous option benefits dominance rather than security, anger should decrease self-control when the gratifying option benefits dominance rather than security. Analogously, anxiety



should increase self-control when the virtuous option benefits security rather than dominance but decrease self-control when the gratifying option benefits security rather than dominance. As in the previous studies, study 3 manipulates whether participants feel angry, anxious, or neither before asking them to make a decision in an unrelated self-control dilemma. Unlike the previous studies, study 3 assesses choice in a different type of self-control dilemma: saving vs. spending money on a discretionary purchase.

## **Method**

Three hundred fourteen participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. The experiment had a 3 (emotion: anxiety, anger, neutral) x 2 (benefit: security, dominance) x 2 (instrumentality: gratifying option, virtuous option) between-subject design.

The study included two parts disguised as unrelated studies. In part one, participants evaluated a brief video selected to elicit anxiety, anger, or neutral emotion, depending on randomly assigned condition. Participants in the anxiety condition viewed a video clip of a plane crash. The video was about the Air France flight 447 which crashed due to bad weather and contained a simulation of the chaos in the cock-pit, just moments before the crash. In the anger condition, participants viewed a video titled “Making the Bus Monitor Cry.” This video showed school children bullying an old lady. In the neutral emotion condition, participants viewed a video about animals from *The National Geographic* collection. Using a video to manipulate emotions lets us examine if

our effect generalizes across a range of different emotion manipulations.

After seeing the video, participants completed a hypothetical choice task as part of an ostensibly separate study. Participants were asked to imagine that they had come across a pair of sunglasses at Ray-Ban's Store that they liked far better than the pair they currently own. They were then asked to make a choice between two gift cards: a gift card to Ray-Ban that would allow them to get the sunglasses they liked and a gift-card to the supermarket that would help them save money by paying for food and other essential items.

We subsequently manipulated the benefit associated with either the virtuous or the gratifying option (see table 3-1 and appendix F). When the benefit was associated with the virtuous option, we described saving money either as leading to dominance (*Research suggests that people who save more money appear more confident and powerful, and also command more attention and higher social status among their peers and friends*) or security (*Research suggests that people who save more money are better prepared for a range of unforeseen risks, are more secure, have fewer health issues and live longer*). Conversely, when the benefit was associated with the gratifying option, we described the sunglasses either as benefiting dominance (*The sunglasses have a reputation as the most prestigious brand on the market and are a top pick amongst sports and fashion celebrities and jet-setting CEOs alike*) or security (*The sunglasses have a reputation for offering the best protection from damaging UV-rays that can cause photokeratitis - a temporary but painful "sunburn" of the cornea - and are therefore highly recommended by eye doctors and pilots alike*). We measured choice in the self-

control dilemma using a 5-point scale from 1 (“Definitely the gift card for the sunglasses”) to 5 (“Definitely the gift card for the supermarket”). Finally, participants completed several individual difference measures, including their attitudes towards Ray Ban sunglasses, gender, and age (full list of measures reported in online appendix G).

**TABLE 3-1**  
**STUDY 3: BENEFITS SPECIFIED ACROSS CONDITIONS**

Condition	Benefit Associated with:	
	Virtuous Option (Saving)	Gratifying Option (Sunglasses)
1. Dominance benefit offered by virtuous option	<i>People who save more money appear more confident and powerful</i>	No benefit mentioned
2. Security benefit offered by virtuous option	<i>People who save more money are better prepared for a range of unforeseen risks</i>	No benefit mentioned
3. Dominance benefit offered by gratifying option	No benefit mentioned	<i>The sunglasses have a reputation as the most prestigious brand on the market</i>
4. Security benefit offered by gratifying option	No benefit mentioned	<i>The sunglasses have a reputation for offering the best protection from damaging UV-rays</i>

## Pretests

We conducted a pretest with a separate sample (N = 65) to ensure that

participants perceived choosing the gift card for the supermarket as requiring more self-control than the gift card for the sunglasses. Participants indicated the self-control required for “choosing the Ray-Ban gift-card” and “choosing the grocery gift-card” on a 5-point scale (1= None, 5 = Very Much). As expected, choosing the grocery gift card was perceived to require greater self-control ( $M = 3.154$  vs.  $2.138$ ,  $t(128) = 4.24$ ,  $p < .001$ ).

We conducted an additional pretest ( $N = 54$ ) to ensure that the videos effectively elicited anxiety, anger, and neither emotion, respectively. Participants viewed one of the three videos and subsequently indicated how anxious, worried, nervous, angry, furious, frustrated, sad and negative they felt on 9-point scales (1= Not at all, 9 = Very much). Ratings for “anxious,” “worried,” and “nervous” were averaged to form a composite score for anxiety (standardized  $\alpha = .91$ ). Ratings for “angry,” “frustrated,” and “furious” were averaged to form a composite score for anger (standardized  $\alpha = .93$ ). Ratings for “negative” and “sad” were averaged to form a composite score for negativity (correlation  $r = .77$ ).

To examine the effects of emotions on ratings of anger and anxiety, we conducted a 2 (measure: anger, anxiety; within-subjects)  $\times$  3 (video: anger, anxiety, neutral; between-subjects) repeated-measures ANOVA. The results confirmed that the videos elicited the expected emotional reactions. Specifically, there was a significant interaction ( $F(2, 51) = 38.28$ ,  $p < .001$ ), such that angry participants ( $M = 5.11$ ) were more angry than anxious participants ( $M = 2.25$ ;  $F(1, 51) = 51.17$ ,  $p < .001$ ) and neutral participants ( $M = 1.43$ ;  $F(1, 51) = 69.75$ ,  $p < .001$ ), whereas anxious participants ( $M =$

4.23) were more anxious than angry participants ( $M = 3.38$ ;  $F(1, 51) = 4.69$ ,  $p < .05$ ) and neutral participants ( $M = 1.98$ ;  $F(1, 51) = 27.21$ ,  $p < .001$ ). Moreover, a between-subjects (video: anger, anxiety, neutral) ANOVA revealed that the video also influenced overall negativity ( $F(2, 51) = 23.47$ ,  $p < .001$ ). Participants in the neutral condition felt significantly less negative ( $M_{\text{neutral}} = 1.89$ ) than those in the anxiety condition ( $M_{\text{anxiety}} = 3.28$ ;  $F(1, 51) = 8.69$ ,  $p < .01$ ) and anger condition ( $M_{\text{anger}} = 5.05$ ;  $F(1, 51) = 45.37$ ,  $p < .001$ ). However, participants in anger condition also felt more negative than anxious participants ( $F(1, 51) = 17.41$ ,  $p < .001$ ). But, because the study only examines the contrast between security and dominance benefit conditions within the emotions condition (i.e., for either angry participants or for anxious participants), and not between emotion conditions (e.g., security benefit for angry participants versus security benefit for anxious participants) this concern does not affect our findings. Thus we do not discuss it further.

## Results

To test how the alignment between the participants' emotion and the benefits associated with the options in the choice set influences self-control, we conducted a 3 (emotion: anxiety, anger, control) x 2 (benefit: security, dominance) x 2 (instrumentality: gratifying option, virtuous option) between-subject ANOVA. In line with our predictions, the effect of emotions on self-control depended on which gift-card was associated with an additional benefit as well as whether that benefit promised dominance

or security (three-way interaction:  $F(2, 301) = 6.72, p = .001$ ; see figures 3-7 and 3-8).

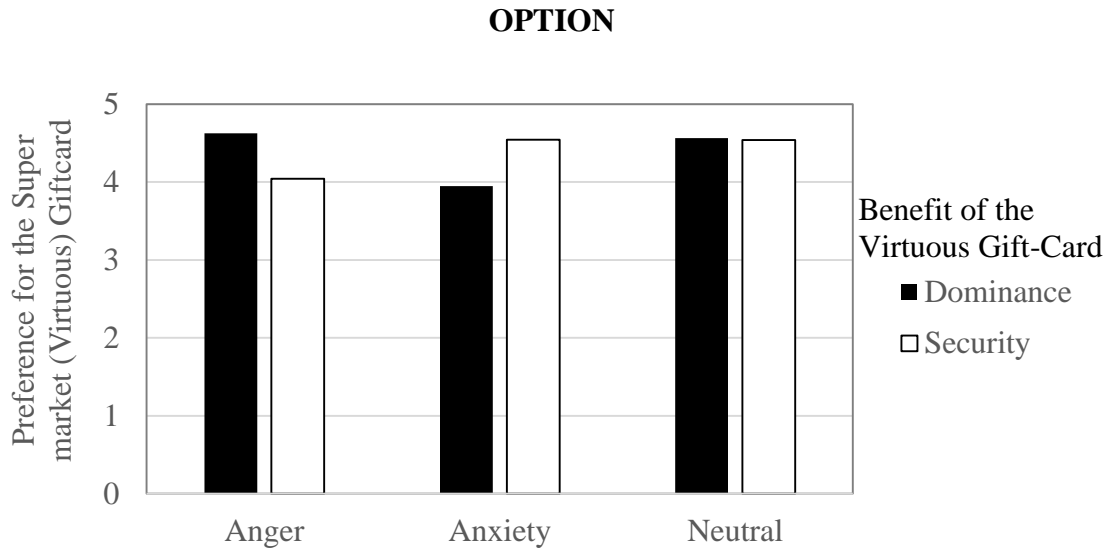
To interpret the interaction, we first examine the results when the benefits were associated with the virtuous option and then examine the results when the benefits were associated with the gratifying option.

Conceptually replicating our previous studies, the data revealed that emotions increased self-control when the virtuous option was associated with a consistent benefit rather than an inconsistent benefit. Specifically, angry participants were marginally more likely to save when saving was linked to confidence and power ( $M_{\text{dominance}} = 4.63$ ) rather than security ( $M_{\text{security}} = 4.04$ ;  $F(1, 301) = 3.23, p = .073$ ). On the other hand, anxious participants were more likely to save when saving was linked to security ( $M_{\text{security}} = 4.55$ ) rather than power ( $M_{\text{dominance}} = 3.95, F(1, 301) = 4.98, p = .026$ ). The benefit of saving money did not influence self-control for participants in the neutral emotion condition ( $M_{\text{security}} = 4.54$  vs.  $M_{\text{dominance}} = 4.57, F(1, 301) = 0.01, \text{NS}$ ).

Interestingly, and consistent with hypothesis 2, the data revealed the opposite pattern when the benefits were associated with the gratifying option. Angry participants were directionally less likely to save when participants read that the sunglasses offered prestige ( $M_{\text{dominance-gratification}} = 4.12$ ) rather than protection ( $M_{\text{security-gratification}} = 4.54$ ;  $F(1, 301) = 1.77, p = .184$ ). On the other hand, anxious participants were significantly less likely to save when the sunglasses offered protection ( $M_{\text{security-gratification}} = 4.00$ ) rather than prestige ( $M_{\text{dominance-gratification}} = 4.54$ ;  $F(1, 301) = 4.36, p = .038$ ). The benefit of purchasing the sunglasses did not influence self-control for participants in the neutral condition ( $M_{\text{security-gratification}} = 4.50$  vs.  $M_{\text{dominance-gratification}} = 4.62, F(1, 301) = .16, \text{NS}$ ).

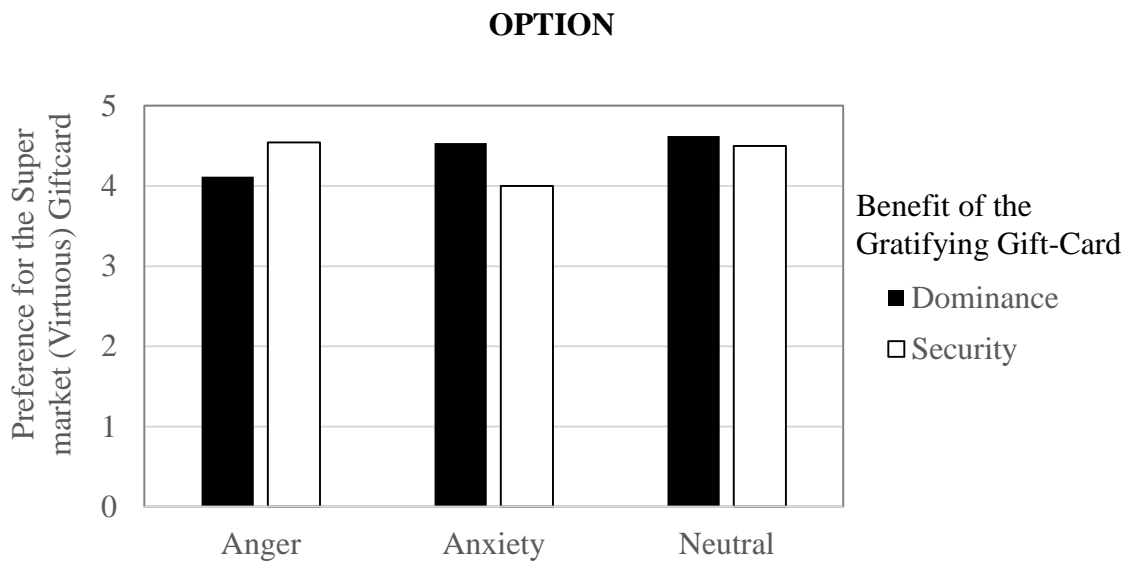
**FIGURE 3-7**

**STUDY 3: SECURITY AND DOMINANCE BENEFITS OF THE VIRTUOUS**



**FIGURE 3-8**

**STUDY 3: SECURITY AND DOMINANCE BENEFITS OF THE GRATIFYING**



## **Discussion**

Study 3 provides further evidence for a goal-based model of choice in self-control dilemmas. First, the study replicated the previous studies by showing that negative emotions are less likely to impair self-control when the virtuous option is more instrumental to the need activated by the emotion (H1). The study also extended the previous studies by showing that negative emotions are more likely to impair self-control when the gratifying option is more instrumental to the need activated by the emotion (H2). Because anger activates a need for dominance, angry consumers are more likely to show self-control when a virtuous option (e.g., saving) benefits dominance rather than security, but less likely to show self-control when a gratifying option (e.g., spending) benefits dominance. Analogously, because anxiety activates a need for security, anxious consumers are more likely to show self-control when a virtuous option (e.g., saving) benefits security rather than dominance, but less likely to show self-control when a gratifying option (e.g., spending) benefits security.

## **Study 4**

The primary purpose of study 4 was to examine a boundary condition for the finding that self-control is higher when the benefits of a virtuous option are aligned with the needs activated by an emotion. The literature shows that consumers are less likely to select options instrumental to their active needs when deciding about the distant future



(e.g., saving money a year from now) rather than the present (e.g., saving money today; Carlson et al. 2013; Laran 2010). Consequently, in this study, we examined if temporal distance to the self-control behavior moderates the effect of emotions on self-control. Specifically, we predicted that angry consumers would be more likely to select a virtuous option that benefits dominance in decisions about the present than in decisions about the distant future. Similarly, we predicted that anxious consumers would be more likely to select a virtuous option that benefits security in decisions about the present than in decisions about the distant future.

Study 4 also extended the previous studies in two additional ways. First, we examined whether the effects of emotions would extend to chronic individual differences in emotions in addition to temporarily activated emotions. Individuals vary in the emotions that they chronically experience (e.g., Coleman and Williams 2013). Some people are regularly anxious, others are regularly angry, and others are typically unemotional. Thus, whereas the previous studies attempted to situationally activate anger or anxiety, study 4 measured stable individual differences in the tendency to experience anger and anxiety. We also extended the previous studies by measuring the extent to which participants engage in a virtuous behavior (i.e., how much money they choose to save) rather than by measuring a dichotomous choice between a virtuous and a gratifying behavior (e.g., whether they choose to save or spend).

## Method

Eight hundred sixty-four participants recruited through Amazon Mechanical Turk completed an online survey in return for a small payment. The survey randomly assigned participants to a condition in a 3 (benefit: security vs. dominance vs. neutral) x 2 (temporal distance to self-control behavior: present vs. future) between-subjects experiment while measuring individual differences in dispositional anger and dispositional anxiety. Our hypotheses predict differences in the contrast between security and dominance benefits. We expect that the effect of neutral benefits on self-control may lie somewhere between security and dominance, but we do not make any formal conditions for the neutral benefits condition.

The study had two parts disguised as unrelated studies. The first part, described as a study on financial decision-making, informed participants that an organization called the “Consumer Federation of America” was encouraging consumers to increase the amount of money they save each year. The organization claimed that one of the most effective ways to save money is to put some or all of one’s tax refund into a savings account. Participants subsequently read that the average American receives \$1000 in tax refund and were asked how much they would be willing to put into their savings account if they were to receive a \$1000 tax refund. To manipulate whether the decision to save money occurred now or in the future, participants in the present condition were told to imagine that they had just received \$1000 in tax refund, whereas participants in the future condition were told to imagine they will be receiving \$1000 in tax refund a year

from now. Furthermore, to manipulate the benefit associated with exerting self-control, the campaign described savings either as offering a security benefit (*Remember, saving money can provide you a lot of security, and give you the ability to protect your family during emergencies*), a dominance benefit (*Remember, saving money can make you rich and powerful, and give you the ability to lead, or positively influence others*), or neither (neutral benefit) (see appendix F).

As an ostensibly separate study, participants next read that the researchers were interested in understanding the relation between demographic factors such as age and gender, and personality. As part of the study, they completed a scale measuring trait anxiety (e.g., "I feel difficulties are piling up so that I cannot overcome them;" Gambetti and Giusberti 2012; Spielberger and Sydeman 1994) and another scale measuring trait anger (e.g., "I get annoyed when I am singled out for correction;" Gambetti and Giusberti 2012; Spielberger and Sydeman 1994). The trait anxiety scale consisted of items that indicated the absence of anxiety (e.g., "I am content", "I am happy") aside from the items that indicated the presence of anxiety (e.g., "I feel difficulties are piling up so that I cannot overcome them"). Because items that measured an absence of anxiety were indicative of a general state of wellbeing and positivity, they could also indicate the absence of other trait negative emotions such as anger and sadness. Therefore, to calculate the measure of trait anxiety we only used items that represented the presence of anxiety. The order of the trait scales was counterbalanced. By using trait scales in this study, we further try to generalize our findings from state emotions to trait emotions. Because essay manipulations may directly prime information related to needs (e.g.,

security and dominance) in addition to the intended emotions, using alternate manipulations, such as videos (study 3) and trait measures of emotions (study 4), helps establish that it is in fact the emotional experience that underlie our predicted effects.

Finally after completing trait emotion scales, participants reported the extent to which they were currently trying to save money on a 5-point scale (1= absolutely not, 5 = definitely yes) and their demographic information. Because the amount of money that participants choose to save in our experiment should depend on the extent to which they are actually trying to save money outside of the lab, we collected this measure to use as a covariate in the analysis. We report the results without the covariate in appendix E.

## **Results**

To assess whether the instrumentality of saving money towards the need activated by anger and anxiety depends on whether the decision takes place immediately or in the distant future, we regressed the amount of the tax refund participants indicated they would save on the manipulated factors, the trait emotion measures, and their interactions. Specifically, we regressed the savings measure on two dummy-coded variables representing the benefit manipulation, one dummy-coded variable representing the temporal distance manipulation, the benefit-by-distance interaction, the mean-centered score on the trait anger scale, the mean-centered score on the trait anxiety scale, and the two and three-way interactions between each trait emotion measure and the variables representing the benefit and distance manipulations, controlling for measure

order and the extent to which the participant was trying to save money outside of the study. As predicted, there were two significant three-way interactions (see table 3-2). Temporal distance moderated the interaction between the trait anger measure and the benefit manipulation ( $F(2, 844) = 3.27, p = .039$ ) as well as the trait anxiety measure and the benefit manipulation ( $F(2, 844) = 3.22, p = .040$ ; see figures 3-9 and 3-10). We used floodlight analysis and the Johnson-Neyman technique (Spiller et al. 2012) to examine the relationship between the trait emotion measures and savings in each of the conditions.

**TABLE 3-2**  
**STUDY 4 RESULTS**

<b>Independent Variables</b>	<b>b</b>	<b>Std Error</b>	<b>F (df)</b>	<b>p</b>
Intercept	27.349 9	1.285	42.56	<.000 1
Benefit			1.31 (2)	.270
Dominance (= 1) vs. Security (= 0)	0.9388	1.1668	0.64	.421
Neutral (= 1) vs. Security (= 0)	-0.9547	1.166	0.672	.413
Temporal Distance (Future = 1, Present = 0)	-0.4189	0.9539	0.194 (1)	.661
Benefit x Temporal Distance			1.08 (2)	.340
Dominance vs. Security, Future vs. Present	-1.3899	2.3334	-1.2	.552
Neutral vs. Security, Future vs. Present	-3.4178	2.3366	-2.92	.144
Anger (standardized)	-0.7195	0.5515	1.69	.192
Anger (standardized) x Benefit			0.2 (2)	.822
Dominance vs. Security	0.8839	1.8058	0.240	.625
Neutral vs. Security	-0.2748	1.7452	0.026	.875
Anger (standardized) x Temporal Distance			0.01 (1)	.905
Future vs. Present	-0.5506	1.454	0.144	.705
Anger (standardized) x Benefit x Temporal Distance			3.27 (2)	.039
Dominance vs. Security, Future vs. Present	-6.8319	2.7807	6.052	.014
Neutral vs. Security, Future vs. Present	-1.5681	2.6028	0.36	.547
Anxiety (standardized)	-0.1013	0.5558	0.032 (1)	.856
Anxiety (standardized) x Benefit			2.74 (2)	.065
Dominance vs. Security	-2.1432	1.7636	1.488	.225
Neutral vs. Security	-3.068	1.7502	3.063	.08
Anxiety (standardized) x Temporal Distance			0.08 (1)	.779
Future vs. Present	-0.11	1.4563	0.006	.940
Anxiety (standardized) x Benefit x Temporal Distance			3.22 (2)	.040
Dominance vs. Security, Future vs. Present	6.453	2.7244	5.617	.018
Neutral vs. Security, Future vs. Present	5.0961	2.6242	3.764	.053
Baseline Saving Goal (standardized)	6.9228	0.4815	28.76	<.001
Scale Order (anger 1 <sup>st</sup> = 1, anxiety 1 <sup>st</sup> = 0)	-0.5132	0.9535	-1.08	.591

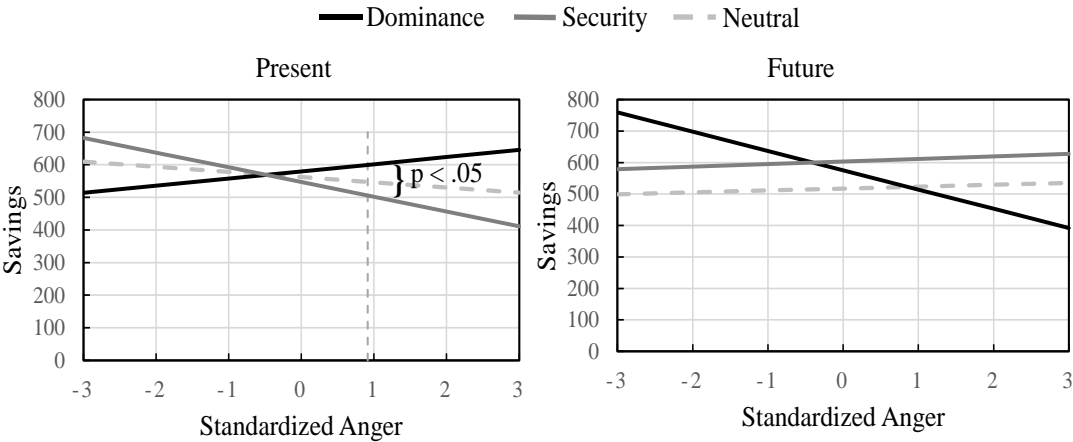
When participants were deciding how much money to save right now, the results conceptually replicated our previous studies. The effects of anger ( $F(1,844) = 2.82, p = .093$ ) and anxiety ( $F(1,844) = 10.95, p = .001$ ) on savings were different in the dominance condition than in the security condition. Consistent with H1, participants who scored more than 0.913 standard deviation above average on the anger scale saved significantly more when savings benefited dominance ( $M = \$600$ ) rather than security ( $M = \$506; F(1,844) = 3.85, p = .05$ ; see the left column of figure 3-9). Furthermore, participants who scored more than 1.0675 standard deviations above average on the anxiety scale saved significantly more when savings benefited security ( $M = \$620$ ) rather than dominance ( $M = \$518; F(1,844) = 3.85, p = .05$ ). Also, participants who scored less than .298 standard deviations below average on the anxiety scale saved significantly less when savings benefited security ( $M = \$527$ ) rather than dominance ( $M = \$597; F(1,844) = 3.85, p = .05$ ) (see the left column of figure 3-10).

On the other hand, however, when participants chose how much money to save in the future, a match between benefit instrumentality and the need activated by the emotion did not increase savings for either anger or anxiety. Consistent with H3, the effect of anger ( $F(1,844) = 3.23, p = .072$ ) on savings was marginally different in the dominance condition and the security condition, but in the opposite direction as findings from the present condition (see the right column of figure 3-9). However, there were not any Johnson-Neyman points (at  $p = .05$ ) within the range of anger scores in the sample. Also, unlike in the present condition but consistent with H3, the effect of anxiety on savings was not different in the security and dominance conditions ( $F(1,844) = 0.01$ ,

NS) (see the right columns in figures 3-10).

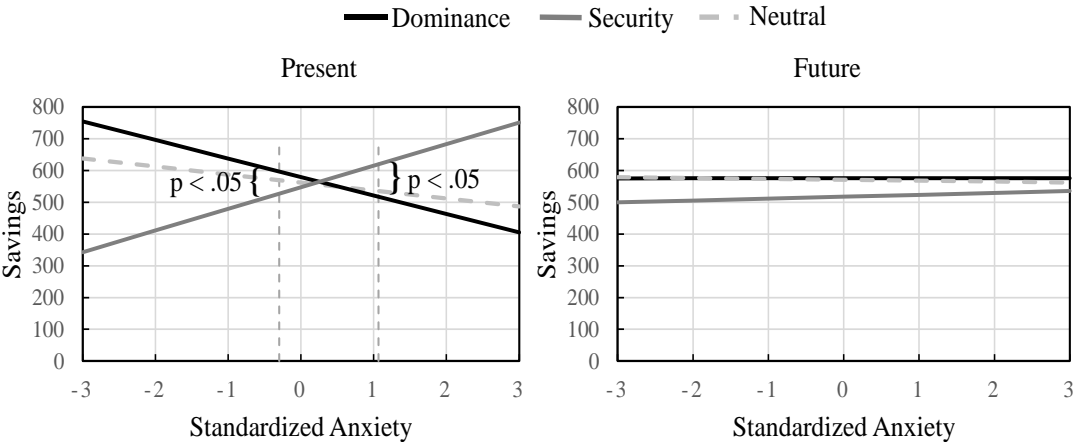
**FIGURE 3-9**

**STUDY 4: EFFECT OF TRAIT ANGER ON SAVING MONEY**



**FIGURE 3-10**

**STUDY 4: EFFECT OF TRAIT ANXIETY ON SAVING MONEY**





## **Discussion**

Study 4 provides further support for our predictions while establishing an important boundary condition. Specifically, the study found that higher scores on a trait emotion measure increased self-control when a virtuous option (saving money) provided a consistent benefit, but only for decisions about the present. When participants decided how much money to save in the future, the instrumentality of saving towards the needs activated by anger and anxiety (dominance and security, respectively) failed to improve self-control. These findings may explain why the effects of emotions on self-control are often weak (Lench et al. 2014). Choices in self-control dilemmas are likely to reflect weak effects if the temporal distance to the behavior, or the atypicality of the context more generally, is not accounted for (Laran 2010; Laran et al. 2008). Finally, this study affirms the robustness of our predictions across different ways of operationalizing emotions and self-control. First, we show that our findings extend beyond state emotions (e.g., emotions primed through videos and essays) to trait emotions as well. Second, we show that the effect of need instrumentality influences not only the choice between a gratifying and a virtuous option, but also influences the extent to which a consumer pursues a virtuous behavior.

## **General Discussion**

One concern with the trend towards society becoming increasingly anxious and

angry is that negative emotions could impair consumers' self-control, which would lead to even more intense feelings of anger and anxiety, not to mention disappointment and regret. Our studies, however, illustrate that the effects of negative emotions on decisions in self-control dilemmas are more complicated and nuanced than generally believed. Rather than unilaterally impairing self-control, the effect of negative emotions on choice in self-control dilemmas depends on the consumer's active needs, as well as the instrumentality of the gratifying and the virtuous options towards those needs. Although the need for hedonic pleasure tends to reduce self-control (Tice et al. 2001), other needs elicited by a negative emotion may enhance or impair self-control, depending on whether or not the specific benefits of the virtuous and the gratifying options in the choice set are instrumental to those needs. Anxiety, which activates a need for security, increases self-control more when the virtuous option in a self-control dilemma provides a security benefit than when it provides a dominance benefit. Anger, on the other hand, activates a dominance need and is consequently more likely to increase self-control when the virtuous option provides a dominance benefit than when it provides a security benefit. Study 1, for example, shows that anxious students are more likely to read a virtuous article if it helps them get a secure job than if it helps them get a prestigious job. Angry students, on the other hand, are more likely to read the article if it will help them get a prestigious job than if it will help them get a secure job.

Studies 2, 3, and 4 provide evidence of the process and boundary conditions for this effect. Study 2 demonstrates that anxiety activates a security need, while anger activates a dominance need. In turn, these activated needs increase self-control when the

benefit of the virtuous option is consistent with the need. Study 3 shows that just as increasing the instrumentality of the virtuous option improves self-control, increasing the instrumentality of the gratifying option impairs self-control. Specifically, anxiety enhances self-control when the virtuous option offers a security rather than a dominance benefit, but also impairs self-control when the gratifying options offers a security rather than dominance benefit. Similarly, anger enhances self-control when the virtuous option offers a dominance rather than a security benefit, but also impairs self-control when the gratifying options offers a dominance rather than a security benefit. Finally, study 4 demonstrates an important boundary condition. Need instrumentality guides decisions about the present but not decisions about the distant future. Specifically, for immediate decisions, anxiety enhances self-control when the virtuous option benefits security rather than dominance and anger enhances self-control when the virtuous option benefits dominance rather than security. However, this effect does not extend to decisions about the distant future.

## **Implications**

Our findings highlight that self-control cannot be simply conceptualized as a tradeoff between immediate benefits and long-term benefits. The benefits provided by the virtuous option are realized in the future (e.g., studying helps students land a future job), but they also facilitate specific higher-order needs, such as security (e.g., finding a stable and secure job) and dominance (e.g., finding a prestigious and influential job).

Therefore, understanding the effects of contexts (e.g., emotions) that activate needs, on self-control, requires identifying the specific needs that the context activates and whether or not these needs are consistent with the perceived benefit of the virtuous and gratifying options in the self-control dilemma.

Our findings also have implications for emotional consumers and people who advise them. Emotional consumers can improve self-control by reminding themselves about the consistent rather than the inconsistent benefits associated with making a virtuous choice. For example, anxious students would be more likely to study if they think about how getting good grades will lead to greater safety and control, whereas angry students would be more likely to study if they think about how good grades will lead to power and prestige. Similarly, policy makers and businesses in the position of giving advice (e.g., gym trainers, or financial advisors) could benefit from customizing their encouragement to emphasize benefits consistent with the dominant emotion that their customers are experiencing. For instance, bankers trying to encourage consumers with low financial literacy to learn more about financial products, such as credit cards, should emphasize the security features offered by credit cards to anxious consumers, but emphasize the status or prestige associated with high-end credit cards to angry consumers. Similarly, policy makers, federal tax agencies, and employers that nudge their workers to save money for retirement or commit their tax returns towards savings may be more effective if the nudges are aligned with the emotions that the workers are experiencing (Kumar and Shah 2011).

Finally, a goal-based choice model not only helps explain the effect of emotions

on choice in self-control dilemmas, the model can also integrate much of past literature on the different factors that influence self-control. Specifically, the goal-based choice model suggests four factors that influence whether or not a consumer exerts self-control. The first is the strength of the consumer's hedonic need ( $N_1$ ). Because the gratifying option in self-control dilemmas better facilitates hedonic needs than the virtuous option ( $GB_1 > VB_1$ ), increasing the activation of hedonic needs increases the likelihood of selecting the gratifying option, whereas decreasing the activation of hedonic needs decreases the likelihood of selecting the gratifying option. Indeed, research shows that increasing the desire to feel better tends to impair self-control (Cryder et al. 2008; Fishbach and Labroo 2007; Garg et al. 2007; Tice et al. 2001), whereas reducing the activation of visceral hedonic cravings, such as hunger and sexual desire, increases self-control (Loewenstein 1996; Van Boven and Loewenstein 2003; Xu, Schwarz, and Wyer 2015).

A second factor that influences self-control is the relative instrumentality of the gratifying and virtuous options towards the consumer's hedonic need. While gratifying options, by definition, offer stronger hedonic benefits compared to virtuous ones (i.e.,  $GB_1 > VB_1$ ), the magnitude of the difference in instrumentality may vary. For example, individuals may either believe that indulging will offer a small, temporary boost to their mood or believe that it will make them exuberant (i.e.,  $GB_1$  can vary in magnitude). Alternatively, individuals may either believe that exerting self control will be a very painful sacrifice or believe that it will be a pleasurable act of frugality (i.e.,  $VB_1$  can vary in magnitude). Consistently, the literature demonstrates that decreasing the

instrumentality of the gratifying options towards hedonic needs increases self-control. For example, mood freeze manipulations (Manucia, Baumann, and Cialdini 1984), which make consumers believe that gratifying won't offer hedonic benefits (i.e., reducing GB<sub>1</sub>), increase self-control (Tice et al. 2001). Conversely, increasing the virtuous option's instrumentality towards hedonic needs also increases self-control. For instance, consumers are more likely to delay gratification when the anticipation of it is pleasurable (Hoch and Loewenstein 1991; Loewenstein 1987; Nowlis, Mandel, and McCabe 2004).

A third factor that influences self-control is the strength of consumers' other (i.e., non-hedonic) needs. For instance, because the virtuous option is better able to help consumers restore control, avoid future regret, and reduce opportunity costs, activating the need for control, regret avoidance, or avoidance of high opportunity costs, tends to improve self-control (Cutright and Samper 2014; Frederick et al. 2009; Hoch and Loewenstein 1991; Patrick, Chun, and Macinnis 2009; Spiller 2011).

The fourth factor that influences self-control is the relative instrumentality of the gratifying (i.e., GB<sub>2</sub>, GB<sub>3</sub>, etc.) and virtuous options (i.e., VB<sub>2</sub>, VB<sub>3</sub>, etc.) towards these other needs (Fishbach and Choi 2012; Zhang, Fishbach, and Kruglanski 2007). Thus, as we show in study 2b, increasing the instrumentality of the virtuous option (i.e., increasing VB<sub>n</sub>) improves self-control, whereas increasing the instrumentality of the gratifying option (i.e., increasing GB<sub>n</sub>) impairs self-control.

## **Limitations and Future Research**

Although we propose a general model of how negative emotions influence decisions in self-control dilemmas, we focus on the effects of two specific negative emotions, anger and anxiety, and two specific benefits, dominance and security. One opportunity for future research will be to investigate the effects of other emotions and other benefits. For example, a goal-based model of choice predicts that disgust, which activates a need to avoid contaminants (Rozin et al. 2008), should improve self-control by decreasing the likelihood that consumers eat unhealthy foods but impair self-control by decreasing the likelihood that consumers exercise in a crowded gym. Similarly, a goal-based model would also predict that embarrassment, which activates a need to be accepted or reintegrated into a group (Keltner and Anderson 2000), should improve self-control when in-group members typically behave virtuously but decrease self-control when in-group members typically gratify.

Successful regulation of self-control typically requires more than a single virtuous decision. It requires making virtuous decisions consistently over a period of time (Campbell and Warren 2015; Vosgerau et al. 2016). Thus, another limitation of our research is that it examines the effects of emotions on a single decision rather than the effects of emotions on a more complex sequence of decisions that ultimately determines consumers' success in regulating their self-control. Because the effects of incidentally manipulated emotions tend to be ephemeral, it would be difficult to examine how incidental emotions influence a series of self-control choices over time. Nevertheless,

there may be an opportunity to test how chronic individual differences in emotions, as measured in study 4, influence sequences of decisions.

Accounting for the interplay between the specific needs activated by an emotion and the benefits of options in self-control dilemmas offers a key to understanding the complex and seemingly inconsistent effects of emotions on self-control. We encourage emotion researchers to continue to think about the needs activated by specific emotions, self-control researchers to think about the benefits linked to the specific gratifying and virtuous options in a choice set, and consumer researchers to think about how to leverage both of these effects to help improve the decisions of marketers, consumers, and policy makers.

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## **CHAPTER 4**

### **CONCLUSION**

Most of us have at one time or another bought a product just because it was available on a deal. While deal proneness can emerge from the desire to save money (Orhun and Palazzolo, 2016), many a times its irrational, and results in excessive or unplanned purchases (Lichtenstein, Netemeyer, and Burton, 1990). However, what causes individual to become temporarily more deal prone is still not clear.

According to past research, the main driver of deal proneness is consumers' desire to acquire more benefits with fewer resources (Fernbach, Kan, and Lynch, 2015; Lichtenstein et al., 1990; Thaler, 1985). In other words, when consumers seek efficiency with resources, they are more likely to exhibit deal proneness. While prior research has shown that this desire to be efficient with resources is influenced by individual differences (Lichtenstein et al., 1990), in this research we identify an important antecedent that can temporarily enhance it. We find that anxiety that stems from the perceived lack of goal progress (Carver and Scheier 1990) activates the desire to seek efficiency. Additionally, by activating the desire to seek efficiency, anxiety not only increases proneness to deals, but also a host of other financial behaviors. For instance, anxiety increases the desire to qualify for free shipping, even if that requires that individuals buy unplanned products, so as to cross over the mark at which free shipping is available. It also causes consumers to overconsume goods or services after paying a fixed cost for unlimited consumption, such as at an all-you-can-eat-buffet. By causing

consumers to thus seek efficiency, anxiety can both help and hurt consumer savings. Therefore, while most of past literature suggests that distress causes individuals to pay a premium on products or services (Cryder, Lerner, Gross, and Dahl, 2008), we find that anxiety's effect on consumer savings, is more complex.

In the second essay we further extend this line of enquiry to examine how negative emotions impact self-control behavior. Negative emotions have generally been shown to harm self-control. For example, distressed consumers eat more junk-food (Garg, Wansink, and Inman, 2007), and save less money (Cryder et al., 2008). However, even though negative emotions have been shown to cause poor behavior, their main function is to help humans cope with problems of survival and reproductive success (Mauss, Levenson, McCarter, Wilhelm, and Gross, 2005). To cope with problems, emotions activate needs (Tooby and Cosmides 1990) that motivate corrective actions. For instance, fear, and anxiety activate the need to avoid uncertainty and risk (Lerner and Keltner, 2001; Tiedens and Linton, 2001), and make safer choices (Raghunathan, Pham, and Corfman, 2006). Thus, if negative emotions are adaptive solutions to challenges in the physical and social environment, there should be at-least some contexts in which they don't impair self-control. Building on this idea, we provide a method to mitigate self-control impairment caused by two widespread negative emotions, namely anger, and anxiety.

We find that anxiety signals a threat in the future, and therefore activates a need to seek security (Raghunathan et al., 2006). Thus, anxious consumers are more likely to exert self-control when it moves them towards security (e.g., saving for a rainy day). On

the other hand, anger is experienced when consumers perceive wrongful interference by others. Therefore, anger activates a need to exert dominance. Consequently, angry consumers are more likely to exert self-control when it moves them towards a position of power (e.g., saving for wealth and influence).

Across these two essays we examine how negative emotions influence a wide range of consumer decisions, from how consumers plan their schedules, and purchase items at the supermarket, to how they make choice between vices and virtues. Through this research we hope to help consumers understand how experiencing negative emotions can alter their consumption patterns. For instance, by being aware that anxiety enhances deal proneness, consumers may be able to cut down on overspending on deals. We also hope to inform strategy aimed at marketing to individuals experiencing negative emotions. For instance marketing products to angry consumers will be vastly different from marketing products to anxious consumers or consumers feeling neutral. Understanding the motivations of emotional consumers can greatly improve how firms interact with these consumers

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**APPENDIX A:**  
**FILTERED PARTICIPANTS IN CHAPTER 2**

**Study 1**

Two hundred and eighty-two participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. Seven responses were dropped because the respondents had already previously taken either the entire study, or the emotion manipulation.

**Study 2**

Four hundred and seventy four participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small compensation. Twenty four participants were excluded because they indicated that they had taken a similar or the same study previously. Eighteen other participants were excluded because they took the entire study twice.

**Study 4**

Two hundred and thirty participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. Twelve participants were excluded because they indicated that they had taken a similar or the same study previously. Two other participants were excluded because they took the entire study twice.

**Study 5**

Four hundred and fifty-eight undergraduate students at a Southwestern university in the United States participated in the study in return for course credit. Seventy nine participants were dropped because they indicated that they had done a previous version of the study.



**APPENDIX B:**  
**STIMULI USED IN STUDIES IN CHAPTER 2**

**Emotion Manipulation used in Study 1, 2, 3 and 4**

Participants were randomly distributed to one of three emotion conditions (“Active Anxiety”, “Passive Anxiety”, “Neutral emotion”). The manipulation consisted of two questions. The question asked in the three emotion conditions were as follows:

Active Anxiety Condition

Most students have a lot to be anxious about—exams, jobs, maintaining healthy weight, getting enough sleep, and other life goals which they have trouble attaining. Think of a couple of such goals that you're anxious about not attaining.

Please write two-three sentences about each of these goals. Please only write about goals that currently make you anxious and not goals that have made you anxious in the past, but are no more active

Now we would like you to take a few minutes to think about each of the goals described above and determine the one that makes you most anxious. Once you have carefully considered this goal, please continue to the next page.

Thinking about which of these goals makes you most anxious, please begin writing down why it makes you anxious? If you can, please write your description so that someone reading this, might be able to empathize with you, and feel your anxiety just by learning about the it. What is it like? What are the worst possible outcomes?

#### Passive Anxiety Condition

There is a lot to be anxious about in the world today – climate change, the uncontrollable spread of viruses like Zika and Ebola, the rising cancer rates, the increase in the number of plane crashes due to bad weather, the ever present threat of terrorist attacks. Think of a couple of such threats that make you feel anxious.

Please write two-three sentences about each of these threats. Please only write about threats that currently make you anxious and not threats that have made you anxious in the past, but are no more active.

Now we would like you to take a few minutes to think about each of the threats described above and determine the one that makes you most anxious. Once you have carefully considered this threat, please continue to the next page.

Thinking about which of these threats makes you most anxious, please begin writing down why it makes you anxious? If you can, please write your description so that someone reading this, might be able to empathize with you, and feel your anxiety just by learning about the it. What is it like? What are the worst possible outcomes?

#### Neutral Emotion Condition

There are a lot of sources of information nowadays– internet articles, informative youtube videos, resources provided by the college library, etc. Think of a couple of sources that you use to access information.

Now we would like you to take a few minutes to think about each of the sources described above and determine the one source that you use the most. Once you have carefully considered this source, please continue to the next page.

Thinking about the one source, please begin writing down why you use this source the most, and continue by writing as detailed a description of the source's advantages. If you can, please write your description so that someone reading this might be able to learn about the source from your description.

### **Study 1 DV**

In the next study you will be doing two tasks:

**VERBAL EXERCISE:** In task 1 you will take a brief verbal exercise.

**VIDEO:** In task 2 you will be asked to evaluate a short video.

You now have two choices. You can either complete the two tasks sequentially or simultaneously (i.e. multitask). If you choose to complete the tasks sequentially, you will first perform the verbal task, and once you have finished it, you will next watch the video. If you choose to complete the tasks simultaneously, you will perform the verbal task while watching the video. What would you like to do?

- ☐ Complete the tasks sequentially.
- ☐ Complete the tasks simultaneously.

### Task 1

Please memorize the following words from German vocabulary and their corresponding English interpretation.

**machen** (verb) *to do, make*

**wissen** (verb) *to know*

**weil** (conj.) *because*

**unter** (prep.) *under*

**doch** (adv.) *however*

### Task 2

Please watch the following video documentary on twins:



## Quiz on Task 1 and Task 2

Next you will take a short quiz on the two tasks you just performed. Answer to the best of your ability. There will be no penalty for wrong answers.

What did the word "*wissen*" mean?

- ☐ to know
- ☐ because
- ☐ to do, make

What did the word "*weil*" mean?

- ☐ to know
- ☐ because
- ☐ however

What did the word "*doch*" mean?

- ☐ to know
- ☐ to do, make
- ☐ however

According to the documentary, a single placenta is a sure sign of:

- ☐ Identical twins
- ☐ A single birth
- ☐ fraternal twins
- ☐ completion of the first trimester of pregnancy

Twins are about \_\_\_\_\_ percent more likely to be born by **cesarean section** than single babies.

- ☐ 25%
- ☐ 30%
- ☐ 50%
- ☐ 60%

Your score is  of 5.

**Study 2 DV**

Unlimited Condition

Pizza

Imagine that you have paid \$12 for an all-you-can-eat Pizza buffet. The buffet contains 10 different varieties of pizzas (medium sized) to choose from.

How many slices of pizza will you eat?

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+
How much slices of pizza will you eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Drinks

Imagine that you are at a party at a private venue. You have paid \$20 for access to an open bar. The \$20 pays for as many drinks as you want from a bar that offers both alcoholic (beer, wine, spirits, cocktails) and non-alcoholic (soda, tea, coffee, juices, smoothies, mocktails) drinks.

How many drinks will you have?

	1	2	3	4	5	6	7	8	9	10+
How many drinks will you have?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pay Per Use Condition

Pizza

Imagine that you are at a Pizza restaurant. You can choose multiple slices from 10 different varieties of pizzas (medium sized). Each slice costs \$4.

How many slices of pizza will you eat?

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+
How much slices of pizza will you eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Drinks

Imagine that you are at a party at a private venue. You can buy beverages at the bar for a cost of \$5 per drink. The bar offers both alcoholic (beer, wine, spirits, cocktails) and non-alcoholic (soda, tea, coffee, juices, smoothies, mocktails) drinks.

How many drinks will you have?

	1	2	3	4	5	6	7	8	9	10+
How many drinks will you have?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Study 2 Covariates

In a typical meal, how many slices of pizza would you usually eat (assuming you were having pizza)?

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+
How many slices of pizza do you usually eat?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When at a social gathering, how many drinks (alcoholic and non alcoholic) would you typically have (assuming you were drinking)?

	0	1	2	3	4	5	6	7	8	9	10+
How many drinks do you usually have?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>









## Study 3 DV

### Hypothetical Shopping Task









Imagine that you're at a store. You have \$15 and you can buy what you want by clicking on the product's image. Through your purchase we can understand the product preferences of college students. Please be as honest as possible. Also, remember, the cost of your basket should not exceed \$15.



Replicate 1

 <p>Ultra Comfort Care Toilet Paper, White, 12 Big Rolls</p> <p>\$6.00 <del>\$9.00</del></p> <p>33% off</p>	 <p>Fresh Glazed Donuts, 6 Counts</p> <p>\$5.00 <del>\$8.00</del></p> <p>38% off</p>
 <p>Triple Action Toothbrush, Full Head Medium, 1 Count</p> <p>\$2.00 <del>\$3.00</del></p> <p>33% off</p>	 <p>Oreo Chocolate Sandwich Cookies, 14.3 oz</p> <p>\$3.00 <del>\$5.00</del></p> <p>40% off</p>
 <p>Buy Any 1 Movie DVD, New Releases</p> <p>\$6.00</p>	 <p>Ultra Sheer Dry-Touch Sunscreen, SPF 45, 3 oz (88 ml)</p> <p>\$5.00</p>
 <p>Doritos Nacho Cheese Flavored Tortilla Chips, 10.5 oz.</p> <p>\$2.00</p>	 <p>Triple Action Toothbrush, Full Head Medium, 40 Counts</p> <p>\$3.00</p>

Replicate 2

 <p>Ultra Comfort Care Toilet Paper, White, 12 Big Rolls</p> <p>\$6.00</p>	 <p>Triple Action Toothbrush, Full Head Medium, 1 Count</p> <p>\$2.00</p>
 <p>Triple Action Toothbrush, Full Head Medium, 40 Counts</p> <p>\$3.00 <del>\$5.00</del> 40% off</p>	 <p>Doritos Nacho Cheese Flavored Tortilla Chips, 10.5 oz.</p> <p>\$2.00 <del>\$3.00</del> 33% off</p>
 <p>Oreo Chocolate Sandwich Cookies, 14.3 oz.</p> <p>\$3.00</p>	 <p>Ultra Sheer Dry-Touch Sunscreen, SPF 45, 3 oz (88 ml)</p> <p>\$5.00 <del>\$8.00</del> 38% off</p>
 <p>Fresh Glazed Donuts, 6 Counts</p> <p>\$5.00</p>	 <p>Buy Any 1 Movie DVD, New Releases</p> <p>\$6.00 <del>\$9.00</del> 33% off</p>

Your total cost is . If more than \$15 please modify your list.

## DV: Scheduling Task

Imagine that you are planning your next two hours, and you have the choice to do several different activities. You are hoping to complete all the activities at some point, but you need to prioritize what you want to do in the next 2 hours.

### Replicate 1

Choose activities that you would like to do in the next 2 hours by clicking on the activity description. Remember all the tasks that you choose should not take more than 2 hours(120 minutes).

Eat at your favorite restaurant. If you go now, you can complete your meal in **60 minutes**. If you delay, the restaurant will be crowded and you will take 90 minutes at the minimum.

Do laundry. It will take **60 minutes**.

Reply to work or school emails while you have a fast internet connection. It will take **20 minutes**. It usually takes around 30 minutes because of slow internet speed.

Browse your updates on Facebook and Social Media. It will take **20 minutes**.

Do an assignment. It will take **30 minutes**.

Shop for groceries. It will take **40 minutes**. If you shop later, you will encounter traffic, and take at-least 60 minutes.

Catch up with friends over coffee or drinks. It will take **30 minutes**. If you delay, it will take you at-least 45 minutes, because you will need to wait for your friends to show up.

Watch a TV show. It will take **40 minutes**.

The cumulative time of all the chosen tasks is  minutes. If more than 120 minutes, please modify your list.

## Replicate 2

Choose activities that you would like to do in the next 2 hours by clicking on the activity description. Remember all the tasks that you choose should not take more than 2 hours(120 minutes).

Reply to work or school emails. It will take **20 minutes**.

Do an assignment. It will take **30 minutes**. If you wait until later you will probably take 45 minutes, because the material will no longer be fresh in your mind.

Catch up with friends over coffee or drinks. It will take **30 minutes**.

Do laundry now while all the machines are open. It will take **60 minutes**. If you do it later you will have to wait for a machine, and will take 90 minutes at the minimum.

Browse your updates on Facebook and Social Media while you have a fast internet connection. It will take **20 minutes**. It usually takes around 30 minutes because of slow internet speed.

Shop for groceries. It will take **40 minutes**.

Watch a TV show. It will take **40 minutes** now since you won't have to see any commercials. If you wait till later, you will will take 60 minutes because you will have to watch the show with commercials.

Eat at your favorite restaurant. You can complete your meal in **60 minutes**.

The cumulative time of all the chosen tasks is  minutes. If more than 120 minutes, please modify your list.

## Study 4 DV

Study 2. You now have the opportunity to complete a second study for which you will be rewarded a bonus. You have the choice to do either of the following two studies.

Note that the studies have different lengths and bonuses. The bonus you receive will depend on which study you select.



Make a series of choices (~ 3 minutes)			
Requester: MTurkLabA&M	HIT Expiration Date: Oct 15 <sup>th</sup> , 2016 (3 days 16 hours)	Reward: \$0.30	
	Time Allotted: 15 minutes	HITs available: 150	



Make a series of choices (~ 10 minutes)			
Requester: MTurkLabA&M	HIT Expiration Date: Oct 15 <sup>th</sup> , 2016 (3 days 16 hours)	Reward: \$0.50	
	Time Allotted: 45 minutes	HITs available: 150	

## Study 5 Stimuli

Study 1 examines:

- 1) What products are popular among students.
- 2) How do students shop online.

In this study, you will be taking a hypothetical Shopping Exercise. So, lets get started.

Imagine that you have a pair of shoes, and sunglasses that are getting old. They still work, but you are considering buying a new pair of sunglasses, and footwear.

So you decide to search an online retailer to buy some new ones.

What is your gender?

- ☐ Male
- ☐ Female

You have the following choice among shoes. They all cost \$59.99. Which one will you buy?

Males were shown the following options



Females were shown the following options



You have the following choice among sunglasses. They all cost \$42.59. Which one will you buy?

Males were shown the following options



Females were shown the following options





Thank you for choosing the products. You will shortly be shown your cart and your order summary.

While the shopping-software prepares your cart, we ask that you take study 2.

### Emotion Manipulations used in Study 5

Study 2: In this study we want to understand how gender impacts life-experiences. To do so we will next ask you specific questions about your life-experiences.

Remember your response will be kept completely anonymous. So we request that you give as comprehensive, and honest a response as possible.

#### Emotion Condition: Anxiety induced by Scarcity of Resources

Most individuals have a lot to be anxious about—exams, jobs, maintaining healthy weight, getting enough sleep, and other life goals which they have trouble attaining. Think of a couple of such goals that you're anxious about not attaining. ***Think specifically about how much time there is left for you to reach these goals, and the activities you need to do to reach these goals. Have you got enough time left to do all the activities you had planned?***

Please write two-three sentences about each of these goals. Please only write about goals that currently make you anxious and not goals that have made you anxious in the past, but are no more active

Now we would like you to take a few minutes to think about each of the situations described above and determine the one situation that makes you most anxious. Once you have carefully considered this situation, please continue to the next page.

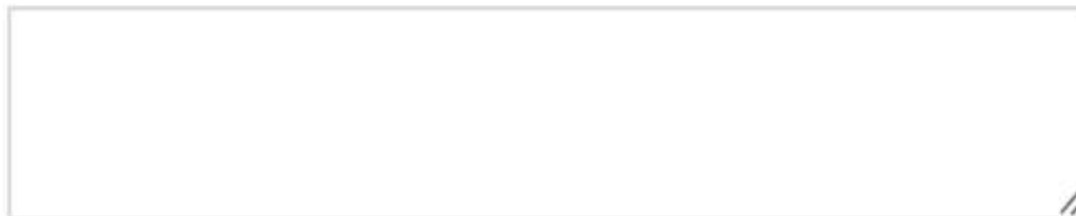
Thinking about which of these makes you most anxious, please begin writing down why it makes you anxious? If you can, please write your description so that someone reading this, might be able to empathize with you, and feel your anxiety just by learning about the it. **Specifically, talk about how much time you have left to reach your goal, and if that will be sufficient.**



#### Emotion Condition: Anxiety Induced by Slow Progress

Most individuals have a lot to be anxious about—exams, jobs, maintaining healthy weight, getting enough sleep, and other life goals which they have trouble attaining. Think of a couple of such goals that you're anxious about not attaining. ***Think specifically about the plans that you had made to reach these goals, and compare that with the progress you have made. Have you been making progress as fast as you'd intended?***

Please write two-three sentences about each of these goals. Please only write about goals that currently make you anxious and not goals that have made you anxious in the past, but are no more active



Now we would like you to take a few minutes to think about each of the situations described above and determine the one situation that makes you most anxious. Once you have carefully considered this situation, please continue to the next page.



Thinking about which of these makes you most anxious, please begin writing down why it makes you anxious? If you can, please write your description so that someone reading this, might be able to empathize with you, and feel your anxiety just by learning about the it.

**Specifically, talk about why you have been slower on your goal than you'd like.**

Emotion Condition: Neutral Emotion

There are a lot of sources of information nowadays— internet articles, informative youtube videos, resources provided by the library, or workplace, etc. Think of a couple of sources that you use to access information.

Now we would like you to take a few minutes to think about each of the sources described above and determine the one source that you use the most. Once you have carefully considered this source, please continue to the next page.

Thinking about the one source, please begin writing down why you use this source the most, and continue by writing as detailed a description of the source's advantages. If you can, please write your description so that someone reading this might be able to learn about the source from your description.

Thank you for your response. Your shopping cart is now ready. Please view your cart.

## Your Cart

Item

Price



Toms Cognac Full Grain Leather

\$59.99



Banana Republic Dory Sunglasses

\$42.49

CART SUBTOTAL

\$102.98

SHIPPING

\$0 (Congratulation. You qualify for free shipping!)

TOTAL

\$102.98

OOPS!! PRODUCT NOT AVAILABLE



Product is temporarily out of stock. It will become available in a month from now.

#### Updated Cart Summary

Item

Price



\$59.99

CART SUBTOTAL	\$59.99
SHIPPING	\$15.00 (Sorry. Shipping is free only above \$100)
TOTAL	\$74.99

## DV

### Condition: Efficiency Hurts Resource Conservation

You now have the following options:

Place the order for just the shoes and pay \$15 for shipping.

Add \$40 giftcard that can be used towards the purchase of any Texas A&M apparel and merchandise, to qualify for free shipping (shipping is free over \$100).

### Condition: Efficiency Helps Resource Conservation

You now have the following options:

Place the order for just the shoes and pay \$15 for shipping.

Place the order for both shoes and sunglasses to qualify for free shipping (shipping is free over \$100), and wait for a month to receive your order.

## APPENDIX C:

### MEASURES USED IN CHAPTER 2

Below we report all the items measured in the studies. We did not use items except those that were reported in the study descriptions in our analyses. All the items were collected after the focal IV and DV had been administered, unless otherwise specified. Items are followed by a number or numbers indicating the studies in which they were used.

Construct	Measures
Mturk ID, Lab ID  <i>(Measured before the IV and DV)</i>	Please enter your Lab ID <small>study 6</small>  Please enter the last 4 digits of your UIN? <small>study 4,5</small>  Please enter your Mturk ID. <small>study 1, study 2, study 3</small>
Study 1	How well do you know German? <i>Very well/ Moderately/ Not at all</i>
Study 2	In a typical meal, how many slices of pizza would you usually eat (assuming you were having pizza)? <i>0 slices/Over 16 slices</i>  When at a social gathering, how many drinks (alcoholic and non alcoholic) would you typically have (assuming you were drinking)? <i>0 drinks/Over 10 drinks</i>

	<p>To what extent are you trying to diet or lose weight? <i>I want to gain weight. / I don't care about my weight. / I want to keep at my current weight. / I am trying to lose few pounds. / I am trying to lose around 10 pounds. / I am trying to lose more than 10 pounds.</i></p>
Study 5	<p>Do you try to Save money? <i>Absolutely Not/ Definitely Yes</i></p> <p>What was the price of the shoes? \$59.99/ \$74.99/ \$42.49/ \$100</p> <p>What was the price of the sunglasses? \$59.99/ \$74.99/ \$42.49/ \$100</p> <p>To qualify for free shipping, the order had to be more than _____? \$59.99/ \$74.99/ \$42.49/ \$100</p>
Household Income, study 1, 2, 4	<p>Indicate total household income. <i>Below \$25,000/Over \$85,000</i></p>
Language, study 1, 2, 4	<p>What is your primary language? <i>English/ Spanish/ Some Other</i></p>
Gender, study 1, 2,5	<p>What's your gender?</p>
Age, study 2	<p>What's your age?</p>
Previous exposure to emotion manipulation	<p>Have you don't the study before? study 1, 2, 4, 5</p> <p>Have you written the essay before? study 1</p>

**APPENDIX D:**  
**FILTERED PARTICIPANTS IN CHAPTER 3**

**Study 1**

Two hundred and forty-four undergraduate students at a Southwestern university in the United States completed the study in return for research credits. Responses by seventy two participants were dropped because they indicated that they were not looking for a job. An additional sixteen participants were dropped because they had taken a previous version of the study before, while twenty two participants were dropped because they indicated that they had already taken the emotion manipulation task in a previous study.

**Study 2a**

Two hundred and sixty two undergraduate students at a Southwestern university in the United States completed the study in return for research credits. Responses by forty-two participants were removed from the dataset. Eleven responses were removed because they had no correct responses for either all of security sentences or all of dominance sentences. The remaining thirty-one participants were removed because they indicated that they had not understood the instructions for responding to the lexical decision task, after completing the study.

## **Study 2b**

Two hundred and three undergraduate students at a Southwestern university in the United States participated in the study in return for credits. Twenty four participants were dropped. Of those, twenty three participants were dropped because they had done a previous version of the study. The remaining one participant was dropped because he indicated that he had already read one of the articles in the self-control task, and therefore had to forcibly choose the other one in the open ended feedback section after debriefing.

## **Study 3**

Three hundred and eighty four participants recruited through Amazon Mechanical Turk (M-Turk) completed an online survey in return for a small payment. Twenty-one participants were dropped because they indicated that they had already seen the video shown in the emotion manipulation task. Additionally, twenty nine participants who has already taken a previous version of the study, and twenty participants who retaken this study a second time were also dropped.



#### **Study 4**

Nine hundred and one participants recruited through Amazon Mechanical Turk completed an online survey in return for a small payment. Thirty seven participants were dropped because they had already done the study.

**APPENDIX E:**  
**RESULTS WITHOUT COVARIATES AND RELATED EXCLUSIONS FOR**  
**CHAPTER 3**

**Study 1**

To test the effects of emotions on self-control, we conducted a 3 (Emotion: anger, anxiety, and neutral)  $\times$  2 (Benefits: security, dominance) between-subjects logistic regression. Unlike the main analysis, we did not filter out participants' who not were looking for a job. In line with our predictions, the effect of the emotion manipulation on self-control depended on whether jobs were associated with dominance or security (two-way interaction: Wald  $\chi^2(2) = 6.00$ ;  $p = .0497$ ). Specifically, emotions increased self-control when jobs were associated with a consistent benefit rather than an inconsistent benefit. Angry participants were more likely to choose the job-interview article over the entertaining article when jobs were described as a path to greater influence (69.44%) rather than security (44.00%, Wald  $\chi^2(1) = 3.85$ ;  $p = .0499$ ). Conversely, anxious participants were directionally more likely to choose the job interview article over the entertaining article when jobs were described as a path to security (53.84%) rather than influence (46.67%, Wald  $\chi^2(1) = .349$ ;  $p = .554$ ). Participants in the neutral condition, were also directionally more likely to read the job interview article when jobs were described as a means to more security (63.64%) rather than influence (46.67%, Wald  $\chi^2(1) = 1.814$ ;  $p = .1781$ ).

## Study 4

To assess whether the instrumentality of saving money towards the need activated by anger and anxiety depends on whether the decision takes place immediately or in the distant future, we regressed the amount of the tax refund participants indicated they would save on the manipulated factors, the trait emotion measures, and their interactions. Specifically, we regressed the savings measure on two dummy-coded variables representing the benefit manipulation, one dummy-coded variable representing the temporal distance manipulation, the benefit-by-distance interaction, the mean-centered score on the trait anger scale, the mean-centered score on the trait anxiety scale, and the two and three-way interactions between each trait emotion measure and the variables representing the benefit and distance manipulations. Unlike the main analysis, we did not control for measure order, and the extent to which the participant was trying to save money outside of the study.

The two focal three-way interactions did not reach significance, but the results were in the same direction. Temporal distance directionally moderated the interaction between both the trait anger measure and the benefit manipulation ( $F(2, 846) = 1.93, p = .146$ ) and the trait anxiety measure and the benefit manipulation ( $F(2, 846) = 1.99, p = .137$ ). When participants choose how much money to save now, a match between benefit instrumentality and the need activated by an emotion directionally increased savings. As in prior studies, dominance and security benefits directionally moderated the effect of anger ( $F(1,846) = 2.37, p = .124$ ) and significantly moderated the effect of anxiety

( $F(1,846) = 10.63$ ,  $p = .001$ ) on savings in the present condition. We used spotlight analysis technique to examine the relationship between the trait emotion measures and savings in each of the conditions. When participants were deciding how much money to save right now, the results were consistent with the predictions. Participants who scored more than one standard deviation above average on the anger scale saved more when savings benefited dominance ( $M = \$595$ ) rather than security ( $M = \$487$ ;  $F(1,846) = 3.70$ ,  $p = .058$ ). Conversely, participants who scored less than one standard deviation below average on the anger scale saved equally when savings benefited dominance ( $M = \$552$ ) or security ( $M = \$581$ ;  $F(1,846) = .23$ , NS). On the other hand, participants who scored more than one standard deviation above average on the anxiety scale saved more when savings benefited security ( $M = \$586$ ) rather than dominance ( $M = \$487$ ;  $F(1,846) = 3.15$ ,  $p = .076$ ), whereas participants who scored less than one standard deviations below average saved less when savings benefited security ( $M = \$483$ ) rather than dominance ( $M = \$661$ ;  $F(1,846) = 9.60$ ,  $p = .002$ ).

Consistent with H3, when participants choose how much money to save in the future, a match between benefit instrumentality and the need activated by an emotion did not increase savings. Neither the interaction between security and dominance benefits and anger ( $F(1,846) = 1.52$ , NS), nor the interaction between security and dominance benefits and anxiety ( $F(1,846) = 0.70$ , NS) was significant.

**APPENDIX F:**  
**STIMULI USED IN STUDIES IN CHAPTER 3**

**Study 1**

Participants were randomly distributed of one of three emotion conditions (“Anger”, “Anxiety, “Neutral emotion”). The manipulation consisted of two questions. The question asked in the three emotion conditions were as follows:

**Anger Condition**

What are the 3-5 things that make you most angry? Please write two-three sentences about each of these things that makes you most angry.

Anger arises when you believe that your goals are being obstructed by external elements. Examples of things you might write about include: being insulted by someone, being purposefully wronged by someone, etc.

Now we would like you to take a few minutes to think about each of the situations described above and determine the one situation that makes you most angry. Once you have carefully considered this situation, please continue to the next page.

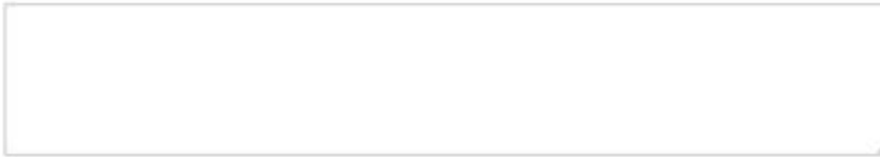
Thinking about the one situation that makes you most angry, please begin writing down what you think of this anger inducing event, and continue by writing as detailed a description of the event as possible. If you can, please write your description so that someone reading this, might be able to empathize with you, and feel your anger just by learning about the situation. What is it like to be in this situation? Why does it make you so angry?

## Anxiety Condition

What are the 3-5 things that make you most anxious? Please write two-three sentences about each of these things that makes you most anxious.

Anxiety arises when you believe that your goals will not be met, and things will not work out in a positive way. Examples of things you might write about include: poor progress on an important goal, health worries, etc.

Now we would like you to take a few minutes to think about each of the situations described above and determine the one situation that makes you most anxious. Once you have carefully considered this situation, please continue to the next page.



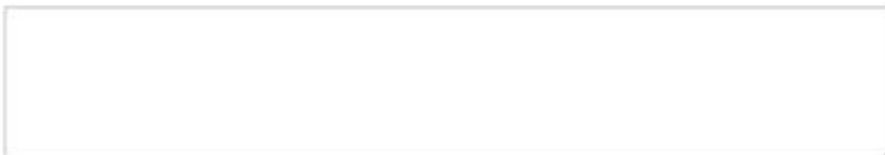
Thinking about the one situation that makes you most anxious, please begin writing down what you think of this anxiety inducing event, and continue by writing as detailed a description of the event as possible. If you can, please write your description so that someone reading this, might be able to empathize with you, and feel your anxiety just by learning about the situation. What is it like to be in this situation? Why does it make you so anxious?



## Neutral-Emotion Condition

What are the 3-5 things that you did in your day today? Please write two-three sentences about each of these things that you did today.

Now we would like you to take a few minutes to think about each of the things described above and determine the one situation that was the most recent. Once you have carefully considered this situation, please continue to the next page.



Thinking about the one situation, please begin writing down what you think of this event, and continue by writing as detailed a description of the event as possible. If you can, please write your description so that someone reading this might be able to imagine those activities by learning about the situation. What is it like to be in this situation?



### Stimuli used to manipulate Perceived Benefits:

#### Dominance condition

Getting a good job has many advantages. A good job allows you to exercise a great deal of influence and power. People with good jobs get to make important strategic decisions at work and acquire far more wealth and status than people who don't have a good job.

However, getting a good job isn't easy. Preparing for job interviews is hard work and can interfere with easier and more enjoyable activities.

For example, right now we want you to choose whether you would prefer to read a technical article about the job interview process or an entertainment article that most people find easier and more enjoyable to read. The job interview article contains common interview questions and responses. The entertainment article contains comedic banter and humorous cartoons. Both articles take approximately the same amount of time to read.

Which article do you want to read?

(Note that the survey will immediately direct you to read whichever article you select.)

Job interview article

Entertainment article

## Security Condition

Getting a good job has many advantages. A good job provides you a great deal of safety and security. People with good jobs are less likely to be laid off during turbulent times and are more protected from social, physical, and financial problems that afflict people who don't have a good job.

However, getting a good job isn't easy. Preparing for job interviews is hard work and can interfere with easier and more enjoyable activities.

For example, right now we want you to choose whether you would prefer to read a technical article about the job interview process or an entertainment article that most people find easier and more enjoyable to read. The job interview article contains common interview questions and responses. The entertainment article contains comedic banter and humorous cartoons. Both articles take approximately the same amount of time to read.

Which article do you want to read?

(Note that the survey will immediately direct you to read whichever article you select.)

Job interview article

Entertainment article

## Neutral-Benefit Condition

Getting a good job has many advantages. People with good jobs lead a pleasant life.

However, getting a good job isn't easy. Preparing for job interviews is hard work and can interfere with easier and more enjoyable activities.

For example, right now we want you to choose whether you would prefer to read a technical article about the job interview process or an entertainment article that most people find easier and more enjoyable to read. The job interview article contains common interview questions and responses. The entertainment article contains comedic banter and humorous cartoons. Both articles take approximately the same amount of time to read.

Which article do you want to read?

(Note that the survey will immediately direct you to read whichever article you select.)

Job interview article

Entertainment article



Measure used to examine whether the participants were looking for a job or not. Options in the rectangle indicated that the participant was not looking for a job.

When do you plan to start looking for a job or an internship?

I do not plan to look for a job/internship.

I already have a job/internship.

I am looking for a job/internship now.

I will start looking for a job/internship before the end of this semester.

I will start looking for a job/internship before the end of the upcoming summer (2017) semester.

I will start looking for a job/internship before the end of the fall (2017) semester.

I will start looking for a job/internship in the next spring (2018) semester.

I will start looking for a job/internship after the next spring (2018) semester.

## Study 2a

Participants were randomly distributed of one of three emotion conditions (“Anger”, “Anxiety”, “Neutral emotion”). The manipulation used was same as in Study 1. Next they were asked to respond to a Lexical Decision Task. In the Lexical Decision Task, they were asked to identify whether or not the sentence they saw on the screen was grammatically correct or not. They were shown the following sentences, on which their response times were recorded.

Sentences related to Security

1. Try to comfort her.

2. Seek shelter during tornadoes.

#### Sentences related to Dominance

1. She dominates the tournament.
2. The captain gave orders.

#### Neutral Sentences

1. They organized the event.
2. The seats are uncomfortable.
3. It's an important concept.
4. They had to comment.
5. Actors performed on stage.

#### Grammatically wrong (non) sentences

1. Not machine working is.
2. Crossword the finished puzzle.
3. They periodically trend do.
4. A parallel it's argument.
5. With stick usually basics.
6. Morning it yesterday started.
7. There alignment between no.

8. Apart subject keep object.
9. Structure has and forum.

## **Study 2b**

### Sentence Scrambling Task

#### Sentences used to manipulate Security Need (unscrambled)

- 1) Try to comfort her
- 2) He felt very vulnerable.
- 3) Parents protect their children.
- 4) Get an affordable insurance.
- 5) Care for the elderly.
- 6) Seek shelter during tornado.
- 7) Doctors relieved his pain.
- 8) Prevent him from drowning.

#### Sentences used to manipulate Dominance Need (unscrambled)

- 1) He had the authority.
- 2) Captain gave the orders.
- 3) They had full command.
- 4) US controls world economy.
- 5) She dominates the tournament.
- 6) I feel very competitive.

7) We're a strong team.

8) It's been a privilege.

Filler sentences common in both the need conditions (unscrambled)

1) What did they buy?

2) Walking in the park.

3) The paint is peeling.

4) They arrived very late.

5) I got up early.

6) She can see you.

7) He drew a picture.

8) It rained this morning.

9) Please pass the salt.

10) I unlocked the door.

11) The ball is red.

12) The birds flew south.

Participants next made the choice between a job-interview article, and an entertaining article. The stimuli used to manipulate perceived benefits of the job-interview article was the same as study 1.

### Study 3

Emotion in this study were manipulated using videos.



The benefits in the choice task were either associated with the virtuous option (saving money by choosing the gift card to the super-market) or the gratifying option (buying an additional pair of sunglasses).

#### Security benefit associated with saving (virtuous option)

According to financial experts, saving is a habit that needs to be developed. Savings has many benefits.

Research suggests that people who save more money are better prepared for a range of unforeseen risks, are more secure, have fewer health issues and live longer.

However, imagine that despite trying to save money, you come across a pair of sunglasses at Ray-Ban's store that you like far better than the pair you currently own.

While you don't need a new pair of sunglasses, you have a strong urge to buy them.

Now imagine that you have the opportunity to choose a gift-card either from Ray-Ban or your local supermarket. The gift card to Ray-Ban would allow you to get the sunglasses but the gift-card to your supermarket would help you save money by paying for food and other essential items.

### Dominance benefit associated with saving (virtuous option)

According to financial experts, saving is a habit that needs to be developed. Savings has many benefits.

Research suggests that people who save more money appear more confident and powerful, and also command more attention and higher social status among their peers and friends.

However, imagine that despite trying to save money, you come across a pair of sunglasses at Ray-Ban's store that you like far better than the pair you currently own.

While you don't need a new pair of sunglasses, you have a strong urge to buy them.

Now imagine that you have the opportunity to choose a gift-card either from Ray-Ban or your local supermarket. The gift card to Ray-Ban would allow you to get the sunglasses but the gift-card to your supermarket would help you save money by paying for food and other essential items.

### Dominance benefit associated with sunglasses (gratifying option)

According to financial experts, saving is a habit that needs to be developed. Savings has many benefits.

However, imagine that despite trying to save money, you come across a pair of sunglasses at Ray-Ban's Store that you like far better than the pair you currently own.

The sunglasses have a reputation as the most prestigious brand on the market and are a top pick amongst sports and fashion celebrities and jet-setting CEOs alike.

While you don't need a new pair of sunglasses, you have a strong urge to buy them.

Now imagine that you have the opportunity to choose a gift-card either from Ray-Ban or your local supermarket. The gift card to Ray-Ban would allow you to get the sunglasses but the gift-card to your supermarket would help you save money by paying for food and other essential items.

## Security benefit associated with sunglasses (gratifying option)

According to financial experts, saving is a habit that needs to be developed. Savings has many benefits.

However, imagine that despite trying to save money, you come across a pair of sunglasses at Ray-Ban's store that you like far better than the pair you currently own.

The sunglasses have a reputation for offering the best protection from damaging UV-rays that can cause photokeratitis - a temporary but painful "sunburn" of the cornea - and are therefore highly recommended by eye doctors and pilots alike.

While you don't need a new pair of sunglasses, you have a strong urge to buy them.

Now imagine that you have the opportunity to choose a gift-card either from Ray-Ban or your local supermarket. The gift card to Ray-Ban would allow you to get the sunglasses but the gift-card to your supermarket would help you save money by paying for food and other essential items.

The choice measure was as follows:

*Which of these gift cards would you prefer?*

Definitely the gift card for the sunglasses

Probably the gift card for the sunglasses

Not sure

Probably the gift card for the supermarket

Definitely the gift card for the supermarket

## Study 4

In study 4, participants' intention to commit a certain amount of their tax refund towards savings was used as a measure of self-control. To set up the scenario participants were told the following:

The Consumer Federation of America has recently started a campaign called 'America Saves' that seeks to motivate individuals to save money.

Benefit associated with the virtuous option (savings) was manipulated as follows:

Security condition:

**Remember, saving money can provide you a lot of security, and and give you the ability to protect your family during emergencies.**

Research finds that one effective way to save money is to put some or all of your tax refund into a savings account.

Dominance Condition:

**Remember, saving money can make you rich and powerful, and give you the ability to lead, or positively influence others.**

Research finds that one effective way to save money is to put some or all of your tax refund into a savings account.

Neutral-Benefit Condition:

Research finds that one effective way to save money is to put some or all of your tax refund into a savings account.

Next, temporal distance to self-control behavior was manipulated as follows:

Present Condition

Most Americans receive over \$1000 in tax returns.

Assume that you just received \$1000 in tax returns.

Of this \$1000 tax refund you just received, how much will you put into your savings account?



Future Condition

Most Americans receive over \$1000 in tax returns.

Assume that you will receive \$1000 in tax returns in a year from now.

Of this \$1000 tax refund you receive a year from now, how much will you put into your savings account?

Saving intentions were measured on a scale of \$0 - \$1000, in increments of \$20.

Trait Anger, and Trait Anxiety were measured using the State-Trait Anger Expression Inventory and State-Trait Anxiety Inventory (Spielberger and Reheiser 2009).

Scores on participants' baseline propensity to save was measured using the following single item.

	Absolutely not	Mostly not	Somewhat	Mostly yes	Definitely yes
Do you try to save money?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## APPENDIX G:

### MEASURES USED IN CHAPTER 3

Below we report all the items measured in the studies. However, barring the items mentioned in the study descriptions, the remaining items were not used in the analyses. We report them for completeness of the study descriptions. All the items listed below were collected after the focal IV and DV had been administered, unless otherwise specified. Items are followed by a number or numbers indicating the studies in which they were used.

Construct	Measures
Relevance of benefits study 2b	To what extend was the statement about jobs relevant to you? <i>1 = Absolutely not relevant / 7 = Absolutely relevant.</i>
What is your overall opinion of article? study 2b	Bad / Good Easy / Difficult Boring / Interesting
Job Search study 1	How knowledgeable were you about questions typically asked in job interviews, before coming to lab today? <i>Not at all Knowledgeable/ Very knowledgeable</i>

	<p>When do you plan to start looking for a job or an internship? <i>I do not plan to look for a job/internship / I am looking for a job/internship now</i></p>
<p>Job Search <small>study 2b</small></p>	<p>To what extent do you agree with the following? <i>Absolutely Not/ Absolutely Yes</i></p> <p>I am looking for a job now.</p> <p>Finding a job is top priority for me.</p>
<p>Mturk ID, Lab ID</p> <p><i>(Measured before the IV and DV)</i></p>	<p>Please enter your UIN. <small>study 2a, 2b</small></p> <p>Please enter your Mturk ID. <small>study 1, study 3, study 4</small></p>
<p>Measure of Emotions</p>	<p>How are you feeling right now? <i>Very Little/ Very Much</i></p> <p>Engaged, <small>study 3</small></p> <p>Anxious, <small>study 3, Study 4</small></p> <p>Positive, <small>study 3, Study 4</small></p> <p>Sad, <small>study 3, Study 4</small></p> <p>Hostile, <small>study 3</small></p> <p>Worried, <small>study 3</small></p> <p>Angry, <small>study 3, Study 4</small></p>

	<p>Negative, study 3, Study 4</p> <p>Attentive, study 3</p> <p>Nervous, study 3</p> <p>Happy, study 4</p>
Decoy to minimize suspicion about emotion manipulation, study 3	<p>Video Feedback Task: How engaging was the video in study 1?</p> <p><i>Not at all / Very Much</i></p> <p>Engaging</p> <p>Interesting</p>
Consumer Spending Self Control Scale (Haws, Bearden, and Nenkov 2011), study 3	<p>Please indicate the level of agreement towards the following statements. <i>Strongly Disagree/ Strongly Agree</i></p> <p>I strongly monitor my spending behavior.</p> <p>I am able to work effectively toward long term financial goals.</p> <p>I consider my needs before making purchases.</p> <p>I often delay taking actions until I have carefully considered the consequences of purchase decisions.</p> <p>When I go out with friends, I keep track of what I am spending.</p> <p>I am able to resist temptation in order to achieve my budget goals.</p> <p>I know when to say when regarding how much I spend.</p> <p>In social situations, I am generally aware of what I am spending.</p>

	<p>Having objectives related to spending is important to me.</p> <p>I am responsible when it comes to how much I spend.</p>
<p>Attitude towards Sunglasses, study 3</p>	<p>Dislike/ Like</p> <p>Bad/ Good</p> <p>Unfavorable/ Favorable</p>
<p>Saving Money, study 4</p>	<p>How important is saving money to you? <i>Absolutely Not/ Definitely Yes</i></p> <p>Do you try to save money? <i>Absolutely Not/ Definitely Yes</i></p>
<p>Assets, study 4</p>	<p>How much assets do you have saved, including money in savings account, and investment in stocks and bonds? <i>\$0/Above \$100,000</i></p>
<p>Debt, study 4</p>	<p>How much do you currently have in debt (credit card loans, loans towards car, home, education, etc.)? <i>\$0/Above \$100,000</i></p>
<p>Household Income, study 4</p>	<p>Indicate total household income. <i>Below \$25,000/Over \$85,000</i></p>
<p>Language, study 4</p>	<p>What is your primary language? <i>English/ Spanish/ Some Other</i></p>
<p>Gender study 1, 2a, 2b, 3, 4</p>	<p>What's your gender?</p>
<p>Previous exposure</p>	<p>Have you don't the study before? study 1, study 2b, study 4</p>

to stimuli	<p>Have you read the job interview article before? study 2b</p> <p>Have you read the entertainment article before? study 2b</p> <p>Have you done the unscramble word-task before? study 2b</p> <p>Have you seen the video you watched in study 1 before? study 3</p>
<p>LDT Instruction</p> <p>Clarity, study 2a</p>	<p>Did you understand the instructions in the sentence recognition task?</p> <p><i>I understood the instructions/ I had trouble in clearly seeing the visual stimuli /I was confused at first, but then understood the instruction after the task started /I didn't understand the instructions.</i></p>

## Attention Filters

### Study 3 and 4 (*Measured before the IV and DV*)

Recent research on decision making shows that choices are affected by context. Differences in how people feel, their previous knowledge and experience, and their environment can affect choices. To help us understand how people make decisions, we are interested in information about you. Specifically, we are interested in whether you actually take the time to read the directions; if not, some results may not tell us very much about decision making in the real world. To show that you have read the instructions, please ignore the question below **about** how you are feeling and instead check only the "none of the above" option as your answer. Thank you very much.

Please check all words that describe how you are currently feeling.

Interested	Hostile	Nervous
Distressed	Enthusiastic	Determined
Excited	Proud	Attentive
Upset	Irritable	Jittery
Strong	Alert	Active
Guilty	Ashamed	Afraid
Scared	Inspired	None of the above

Study 4 (*Measured after the IV and DV*)

In the tax-refund question, what was the amount that the average American was said to receive?

- \$1000
- \$1020
- \$1050
- \$1080
- \$1100
- \$1120

Sound Check Question

Study 3 (*Measured before the IV and DV*)

What sound do you here in the following video?

They were then instructed to here an audio stimuli. They were given the following options:

- Dog

- Cow
- Rain
- Cat
- Lion's Roar
- Frog
- A Baby crying

The right answer was Cat.



## References

Haws, Kelly L., William O. Bearden, and Gergana Y. Nenkov (2012) , “Consumer Spending Self-control Effectiveness and Outcome Elaboration Prompts,” *Journal of the Academy of Marketing Science*, 40(5), 695-710.